ORDER NO. KM40010705C1

F12

Service Manual

Telephone Equipment

4-LINE DIGITAL VOICE MAIL SYSTEM

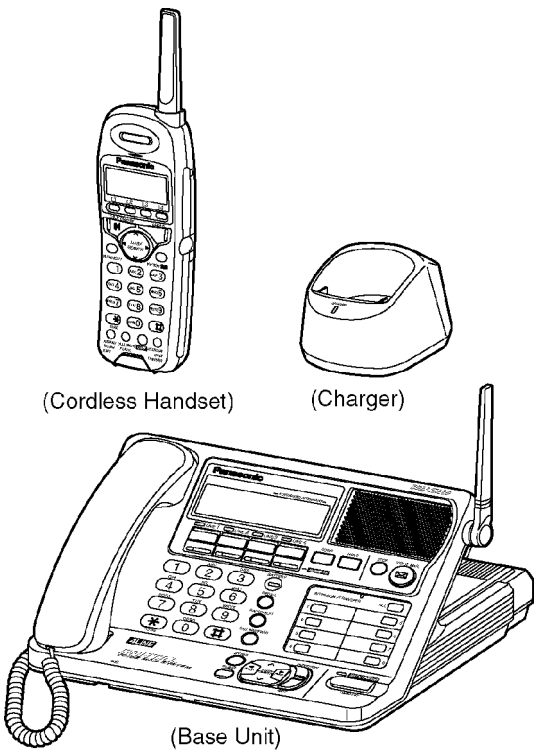
Caller ID Compatible

KX-TG4000B

2.4GHz Multi-Handset Cordless Phone System

Black Version

(for U.S.A.)



SPECIFICATIONS

SPECIFICATIONS

	Base Unit	Cordless Handset
Power Source	AC Adaotor(PQLV12Z)	Rechargeable Ni-MH battery
Receiving/Transmitting Frequency	75 channels within 2401.056～2478.816MHz	75 channels within 2401.056～2478.816MHz
Receiving Method	Single Heterodyne	Single Heterodyne
Oscillation Method	PLL synthesizer	PLL synthesizer
Detecting Method	Quadrature Discriminator	Quadrature Discriminator
Tolerance of OSC Frequency	±150kHz	±150kHz
Modulation Method	Frequency Modulation	Frequency Modulation
ID Code	40bit	40bit
Dial Mode	Tone(DTMF)/Pulse	Tone(DTMF)/Pulse
Directory	Up to 22 digits	Up to 22 digits
Power Consumption		"4days at Standby , 8hours at TALK"
Dimension(H × W × D)	4 28/32" × 10 21/32" × 9 7/32"(123 × 270 × 233mm)	8 29/32" × 2 7/32" × 1 3/8"(225 × 56 × 35mm)
Weight	3.42lbs.(1550g)	0.42lbs.(190g)with battery

Design and specifications are subject to change without notice.

Panasonic

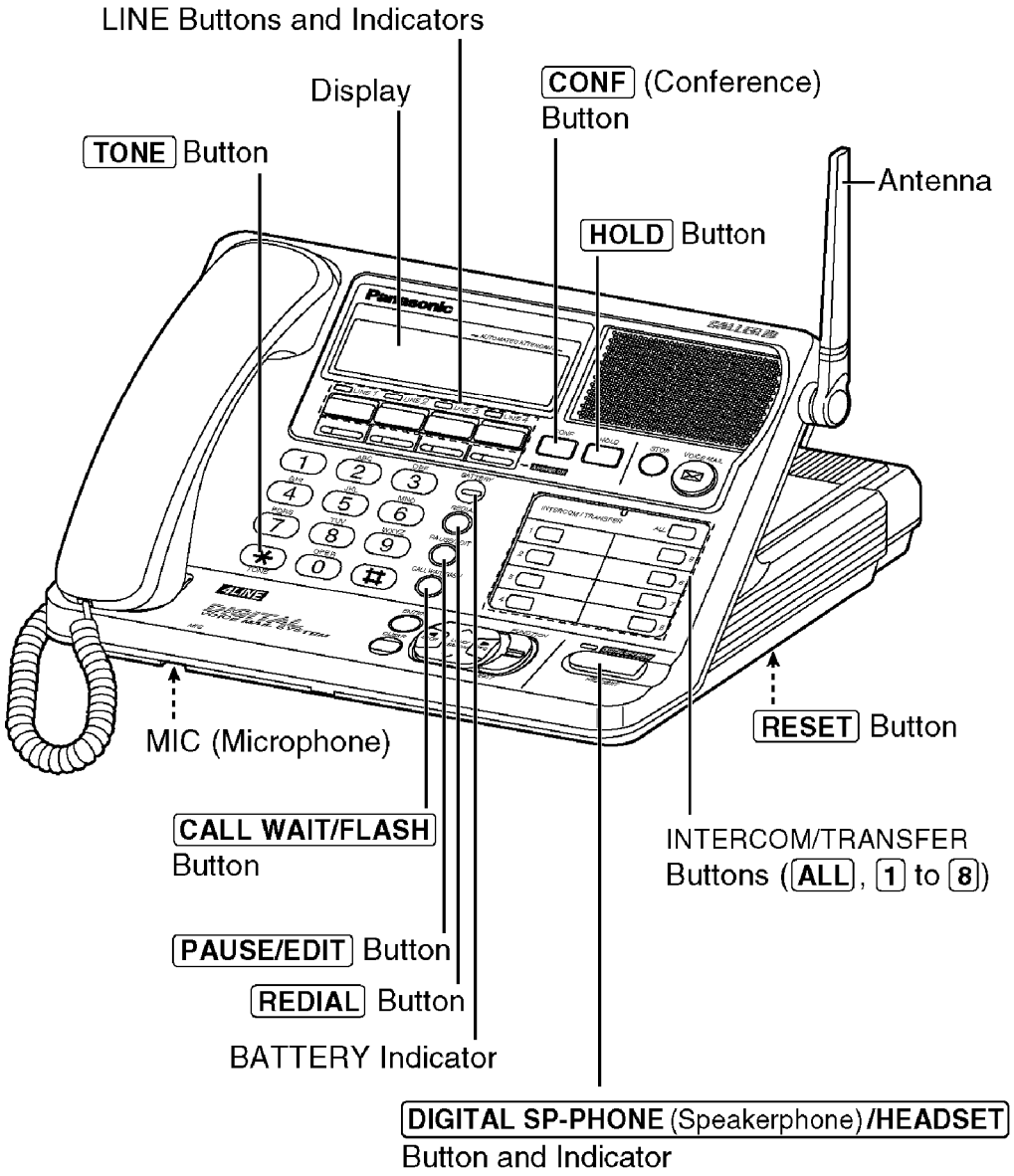
IMPORTANT SAFETY NOTICE

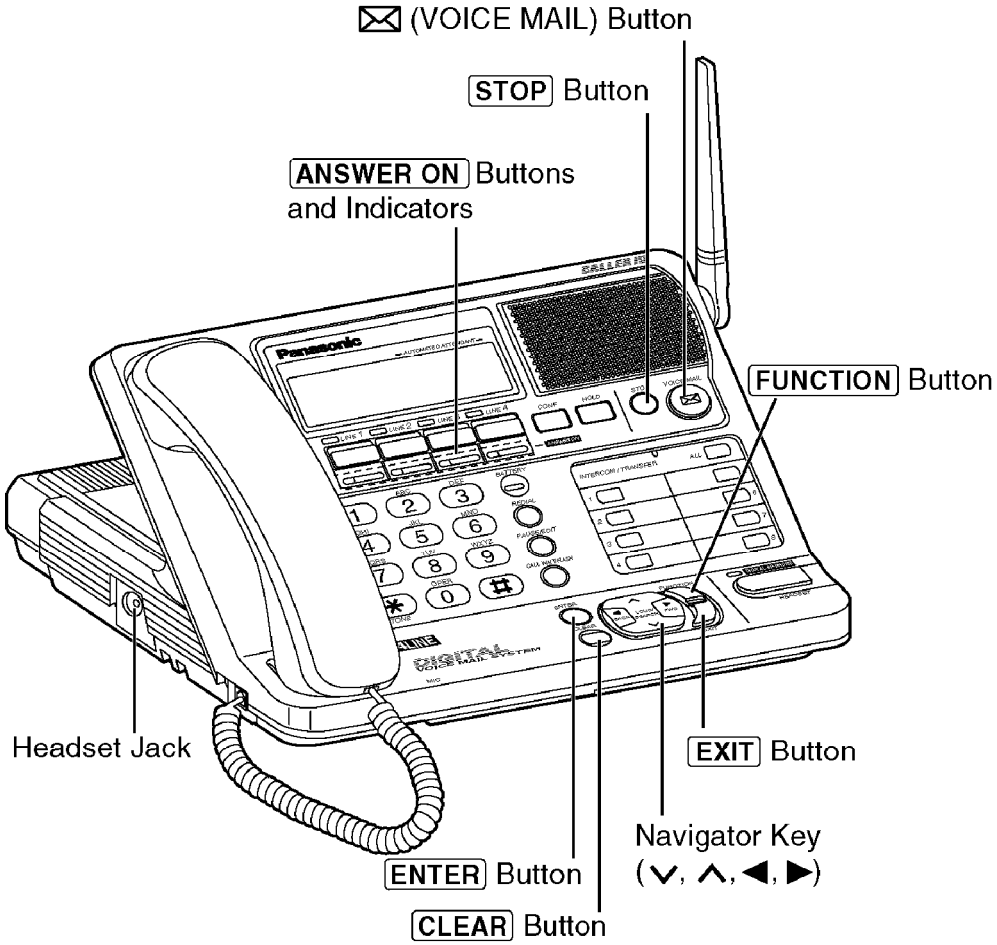
There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

1. OPERATION

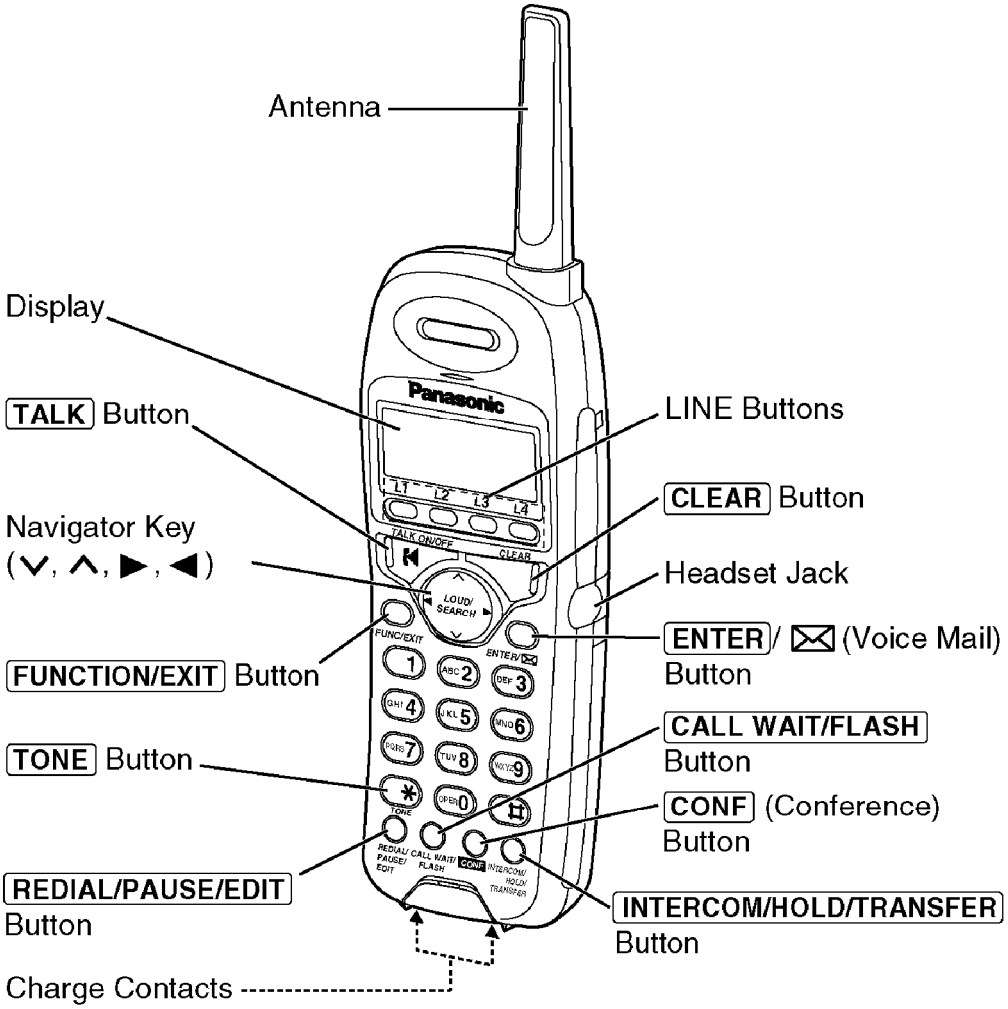
1.1. Location of Controls

1.1.1. Base Unit

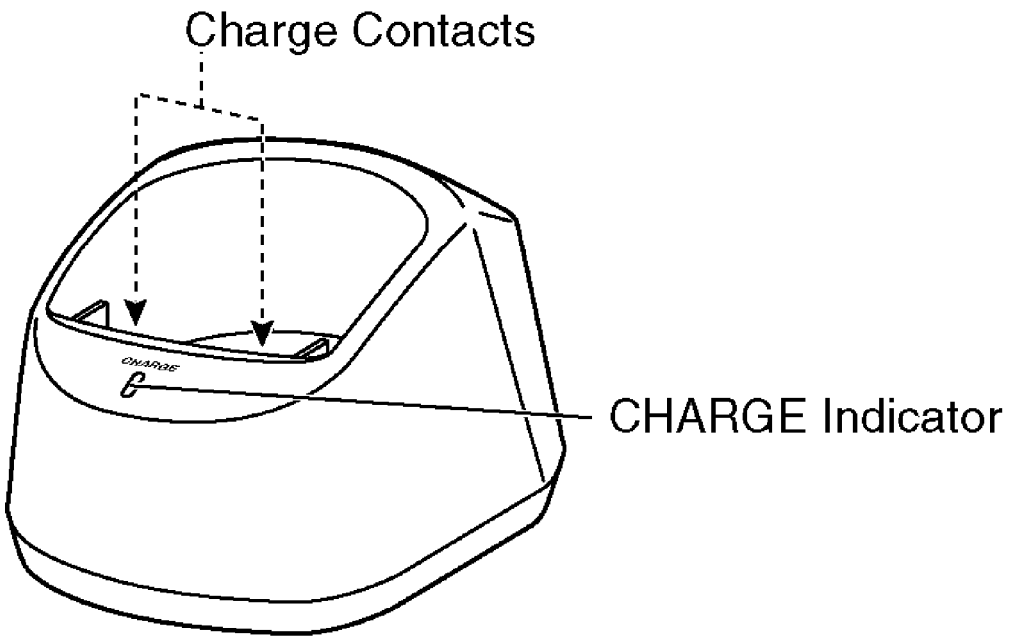

LINE Buttons and Indicators
Display
CONF (Conference) Button
TONE Button
Antenna
HOLD Button
MIC (Microphone)
RESET Button
CALL WAIT/FLASH Button
INTERCOM/TRANSFER Buttons (ALL, 1 to 8)
PAUSE/EDIT Button
REDIAL Button
BATTERY Indicator
DIGITAL SP-PHONE (Speakerphone)/HEADSET Button and Indicator



1.1.2. Cordless Handset

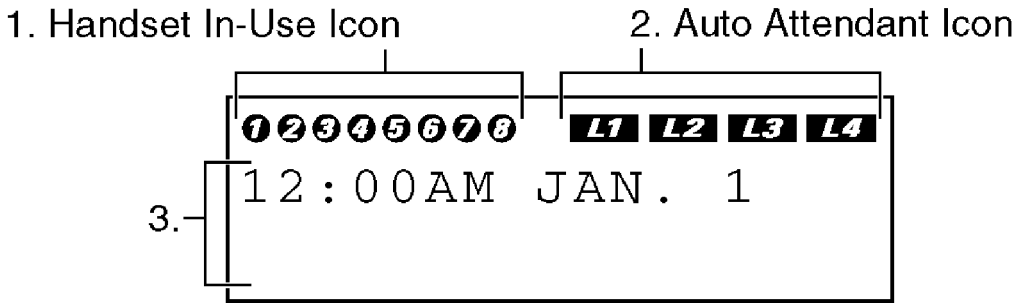

Antenna
Display
TALK Button
Navigator Key
(▼, ▲, ▶, ◀)
FUNCTION/EXIT Button
TONE Button
REDIAL/PAUSE/EDIT
Button
Charge Contacts
LINE Buttons
CLEAR Button
Headset Jack
ENTER/ ✉ (Voice Mail)
Button
CALL WAIT/FLASH
Button
CONF (Conference)
Button
INTERCOM/HOLD/TRANSFER
Button

1.1.3. Charger


Charge Contacts
CHARGE
CHARGE Indicator

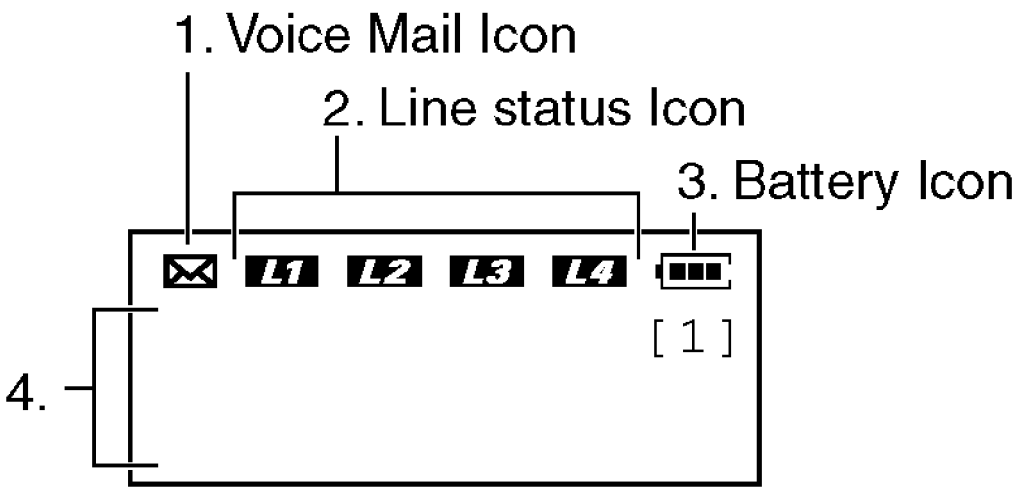
1.2. Displays

1.2.1. Base Unit



1. **The handset in-use icon indicates the status of registered cordless handsets. If a cordless handset is in the talk or intercom mode, or listening to messages, the relevant number is displayed.**
2. **If you turn the Automated Attendant System on, the relevant line icon is displayed.**
3. **The time and data are displayed on the first line in the standby mode. The display shows the dialed number, call status, programming options and directory items etc. If you subscribe to a Caller ID service, caller information will be displayed.**

1.2.2. Cordless Handset



1. **The voice mail icon flashes if there is at least one new message in your mailbox During playback, it will be displayed.**
2. **The line status icons function as follows.**

Off (invisible)	The line is free.
On	The line is being used.
Flashing	A call is on hold. The Automated Attendant System or Answering System is responding to a call.
Flashing quickly	A call is being received.

3. The battery icon indicates the battery strength.
4. The handset number ([1] to [8]) is displayed in the standby mode. The display shows the dialed number, call status, programming options and directory items etc. If you subscribe to a Caller ID service, caller information will be displayed.

1.2.3. Backlit LCD Displays

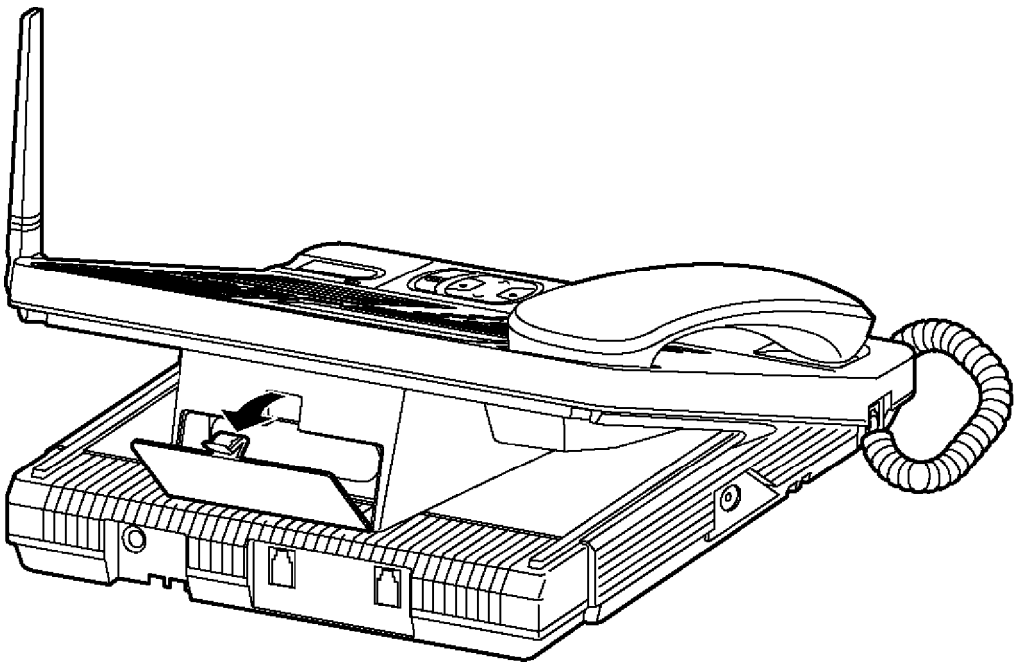
Both the base unit and cordless handset have a backlit LCD display. The lighted cordless handset display will stay on for about 10 seconds after pressing a button or lifting the handset off the charge.

1.3. INSTALLATION

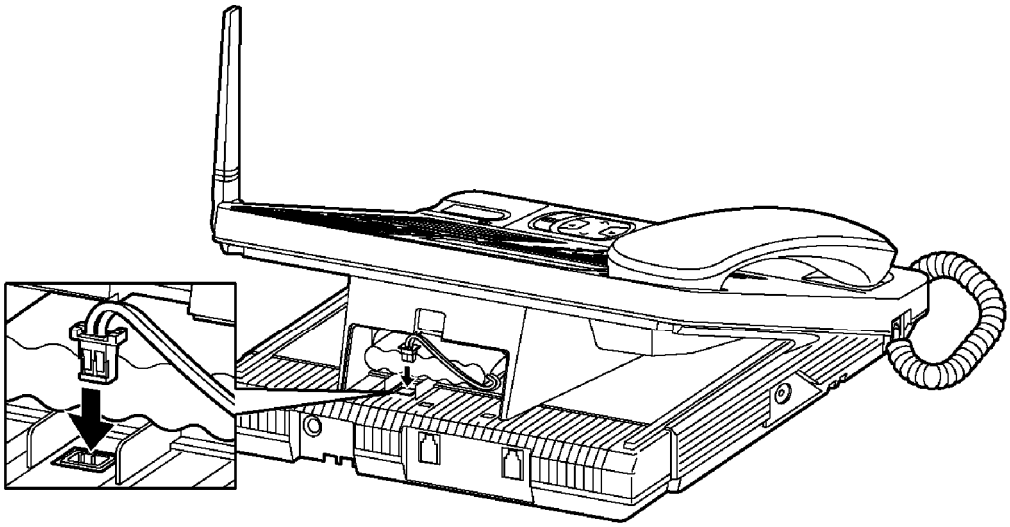
1.3.1. Installing the Backup Battery in the Base Unit

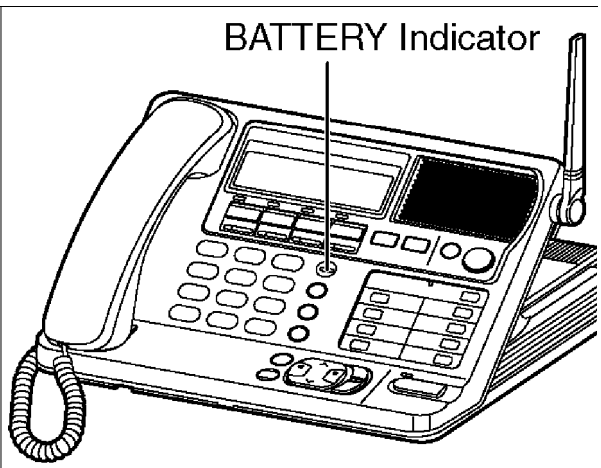
A rechargeable Ni-Cd battery works as emergency power during a power failure. The fully charged backup battery provides the base unit with a minimum of 20 minutes operation. The battery is charged in the base unit while the AC adaptor is connected. It takes about 10 hours to charge fully.

1. Open the battery cover.



2. Install the backup battery in the battery compartment. Close the battery cover.

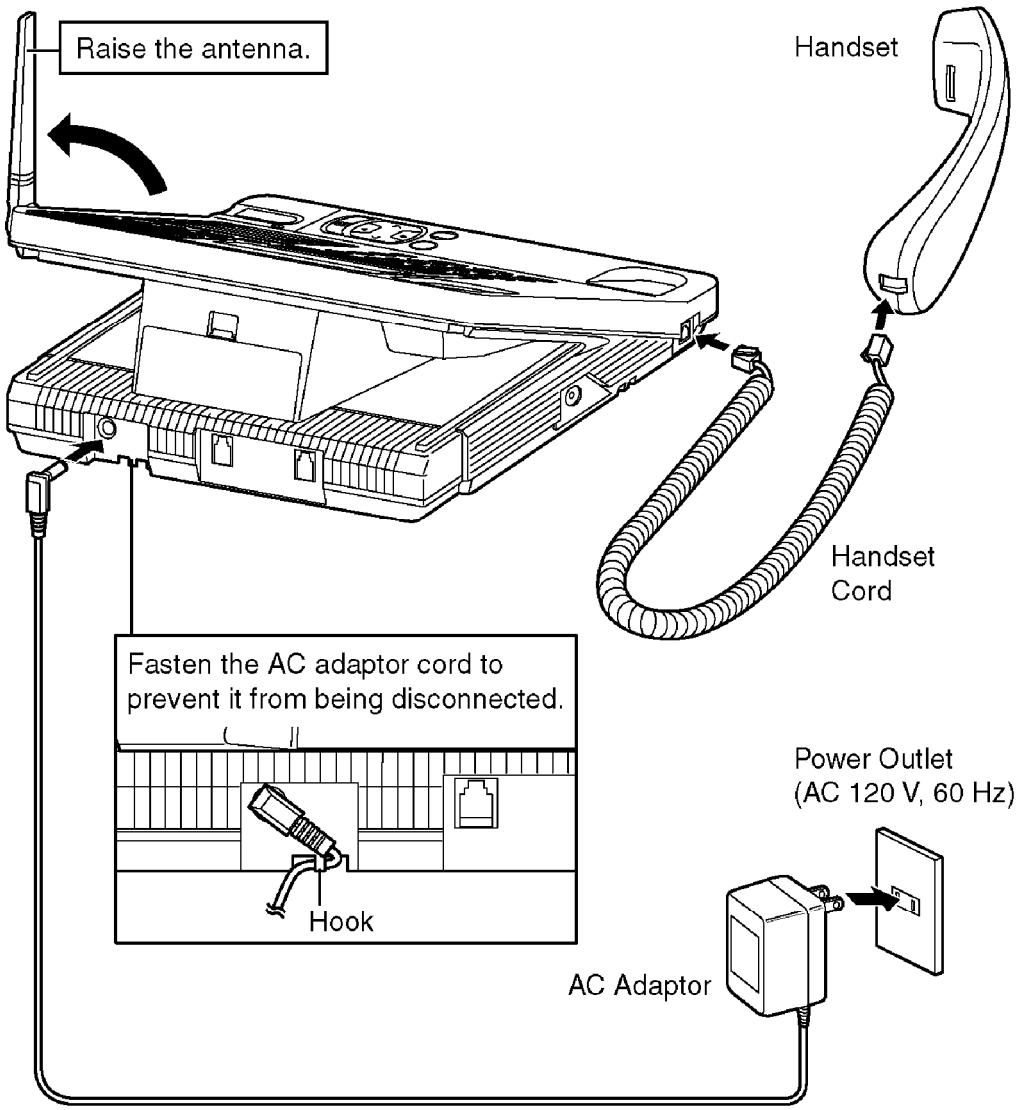


Battery Indicator: **-The BATTERY indicator lights while the battery is being charged.** **-During a power failure (or if the AC adaptor is disconnected), the BATTERY indicator shows the battery strength:** **Full to Medium: The indicator lights.** **Low: The indicator flashes.** **No power: The indicator light is off.**	

- The battery cannot be overcharged.

- If the backup battery has been discharged during a power failure, the unit will not work. If required, you can connect a standard telephone on the same line.

1.3.2. Connecting the Handset and AC Adaptor

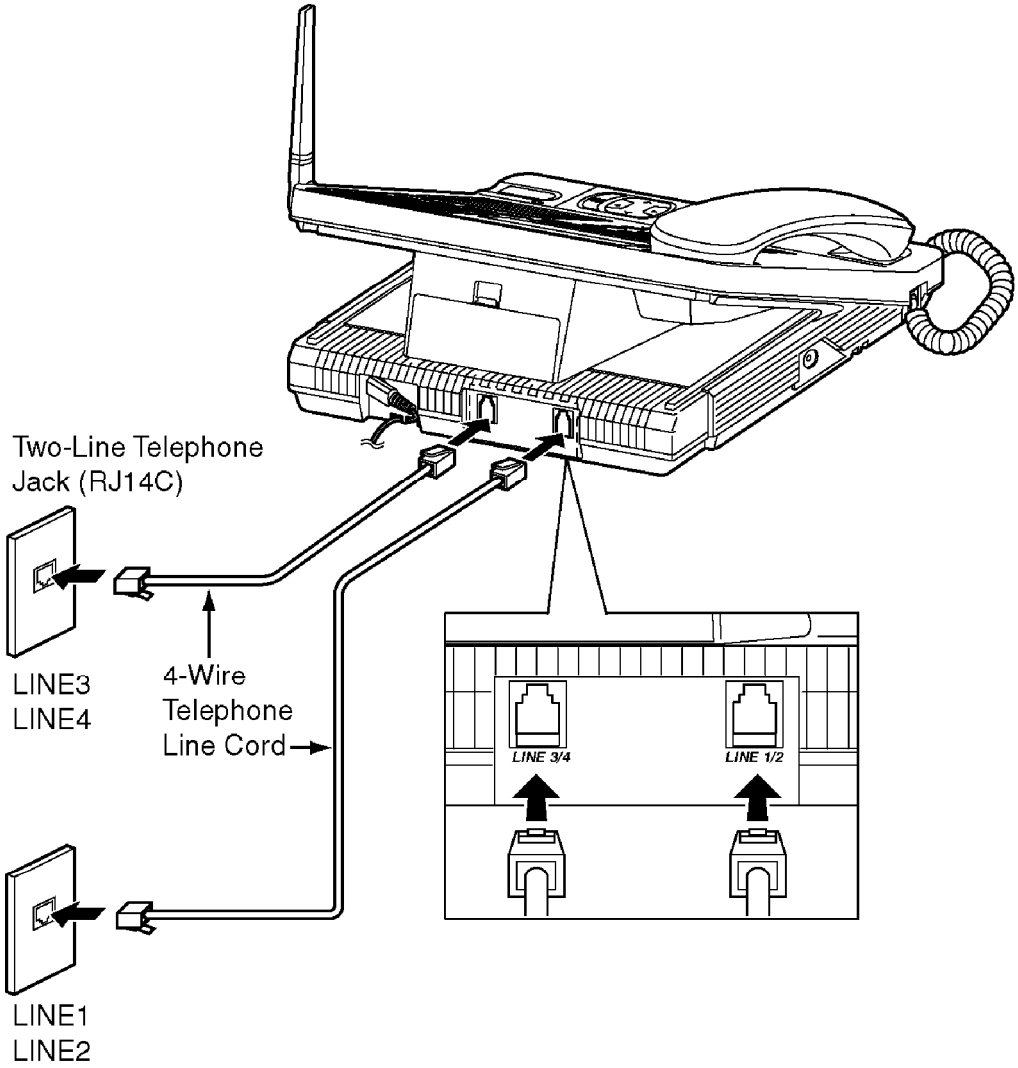


- Use only a Panasonic Handset for the KX-TG4000B.
- USE ONLY WITH Panasonic AC ADAPTOR PQLV12Z.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- The BATTERY indicator lights while the AC adaptor is connected with the backup battery installed.
- If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.

1.3.3. Connecting the Telephone Line Codes

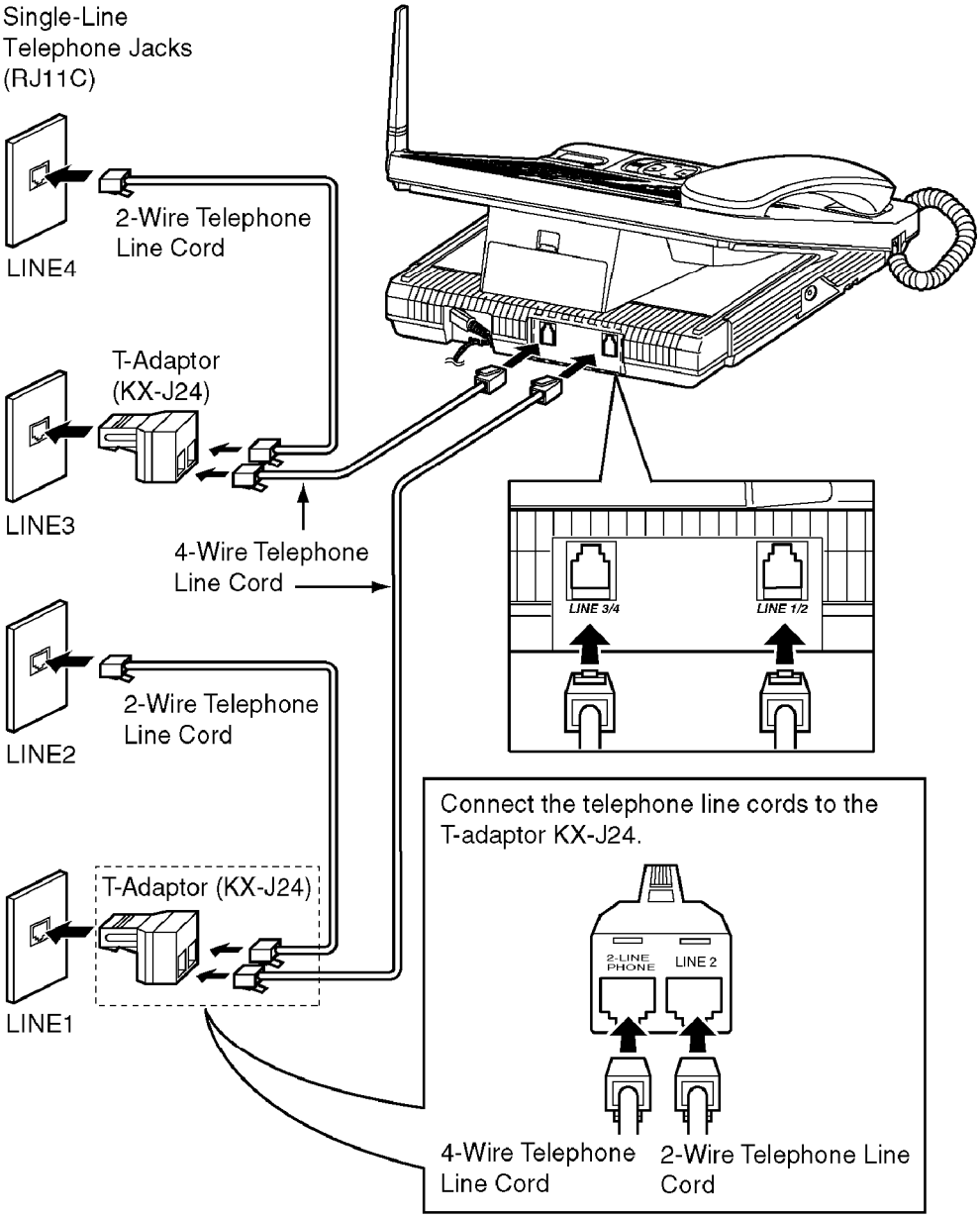
Connect the telephone line cords to the base unit

1.3.3.1. To Connect 2 Two-Line Telephone Jacks



1.3.3.2. To Connect four Single-Line Telephone Jack

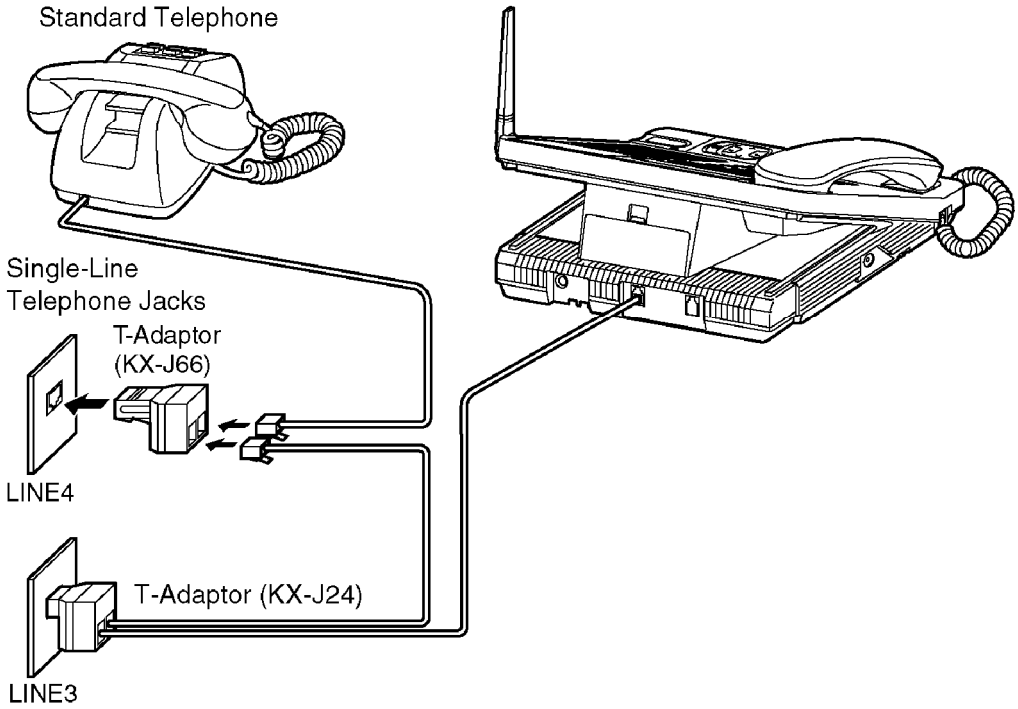
For this connection, please purchase two Panasonic T-adaptors KX-J24 and two 2-wire telephone line cords.



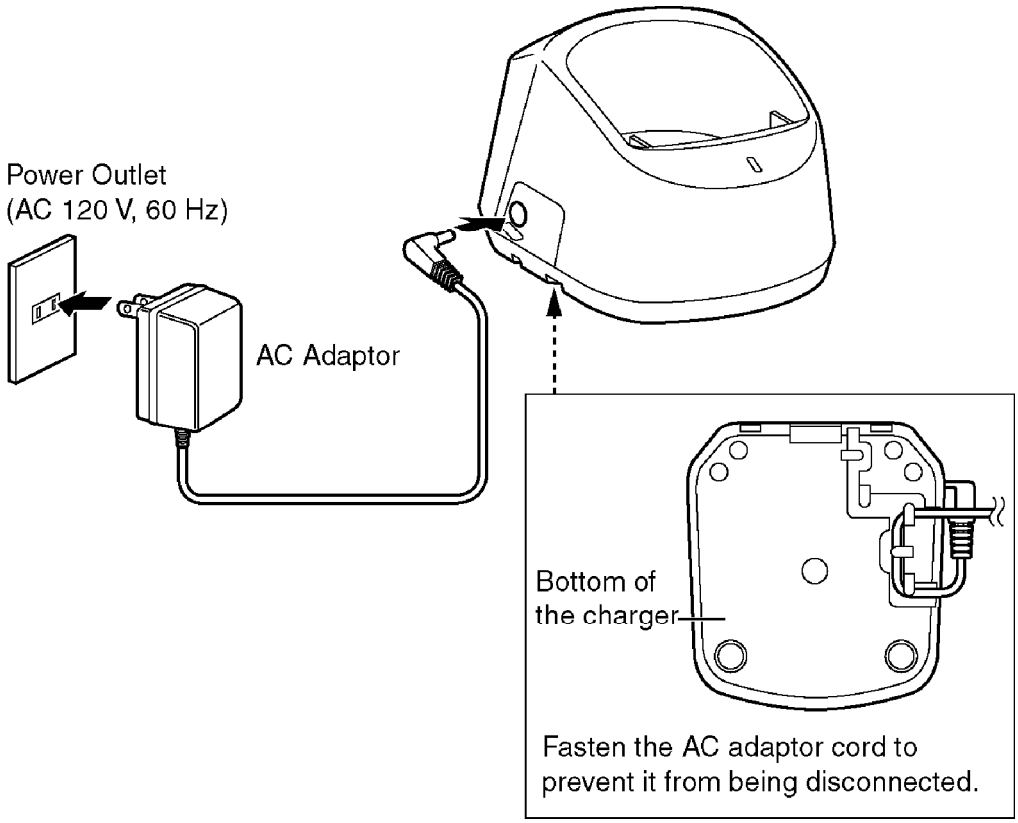
1.3.4. Adding Another Phone

If the backup battery has been discharged during a power failure, the unit will not work. If required, you can connect a standard telephone on LINE 2 or LINE 4 of this unit using the Panasonic T-adaptor KX-J66.

Ex. Connecting a standard telephone on LINE 4.



1.3.5. Connecting the AC Adaptor to the Charger



- USE ONLY WITH Panasonic AC ADAPTOR KX-TCA1-G.

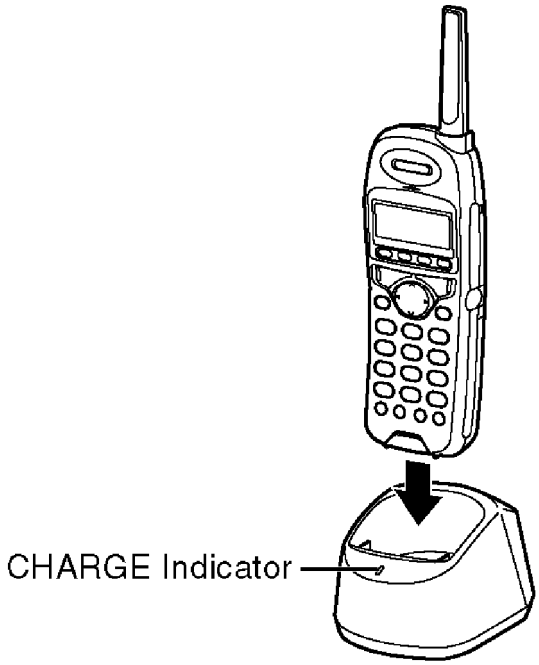
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)

1.3.6. Handset Battery Charge

Place the cordless handset on the charger and charge for about 8 hours before initial use. Make sure the handset faces forward as shown.

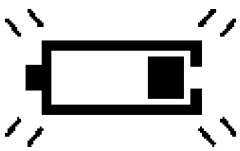
- The CHARGE indicator lights.

- If you charge the discharged battery, it will be charged quickly. In that case the handset may feel warm. This is normal.



1.3.6.1. Handset Battery Strength

You can check the battery strength on the handset display. / The battery strength is shown as in the chart below.

Display prompt	Battery strength
	Fully charged
	Medium
	Low
 **(flashing)**	**Needs to be recharged.**

1.3.6.2. Recharge

Recharge the battery when:

— "Recharge" is displayed on the handset, / — " **" flashes on the handset display, or / — the handset beeps intermittently while it is in use.**

- If you DO NOT recharge the battery for more than 15 minutes, the display will keep indicating “Recharge” and/or “” will continue to flash.

1.3.6.3. Handset Battery Information

After your Panasonic Battery is fully charged.

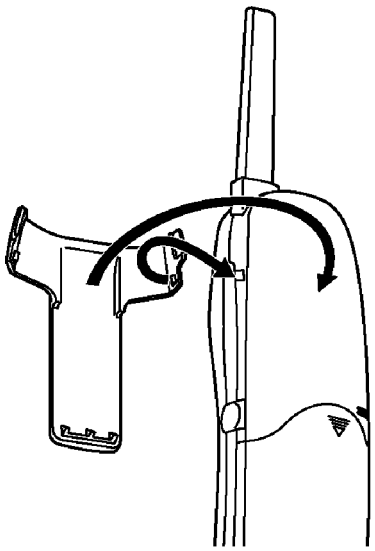
Operation	Approx. battery life
While in use (TALK)	Up to about 8 hours
While not in use (Standby)	Up to about 4 days

- Battery life may be shortened depending on usage conditions and ambient temperature.
- Clean the charge contacts of the handset and the charger with a soft, dry cloth once a month. Clean more often if the unit is subject to grease, dust or high humidity. Otherwise the battery may not charge properly.
- If the battery is fully charged, you do not have to place the handset on the charger until “Recharge” is displayed and/or “” flashes. This will maximize the battery life.
- The battery cannot be overcharged.

1.3.7. Using the Handset Belt Clip

you can hang the cordless handset on your belt or pocket using the belt clip.

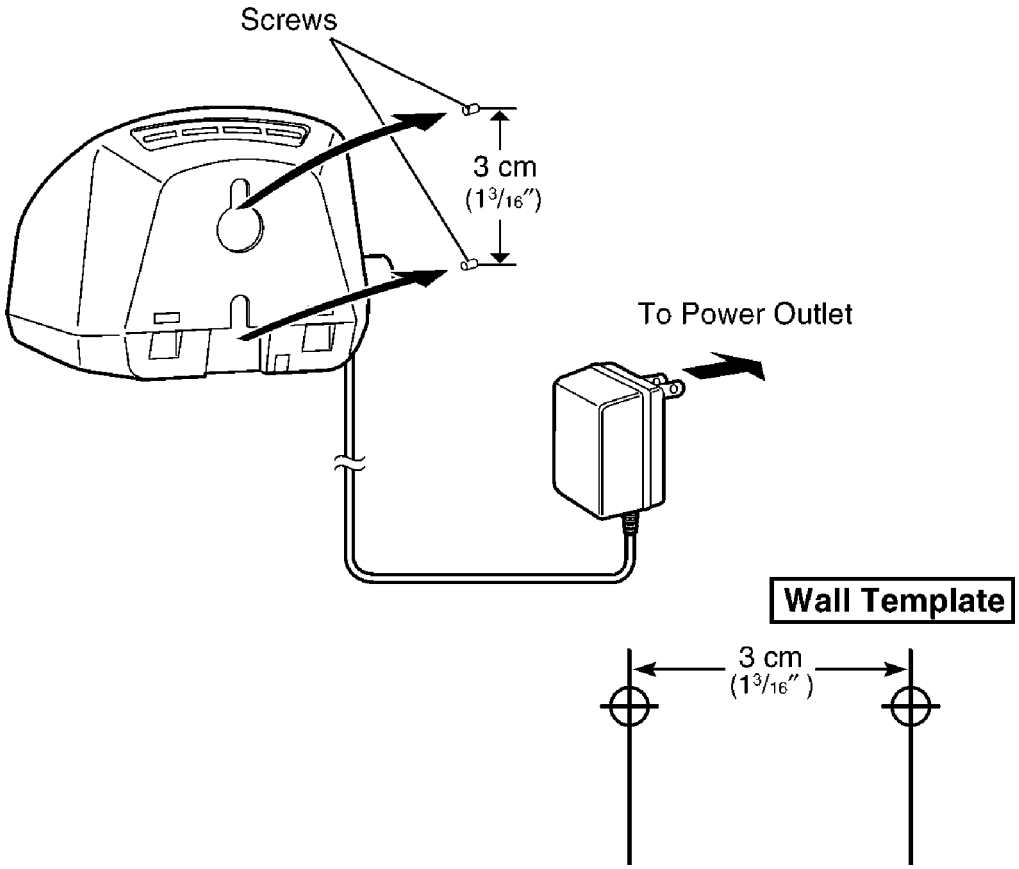
To attach the belt clip



To remove the belt clip

1.3.8. Wall Mounting for the Charger

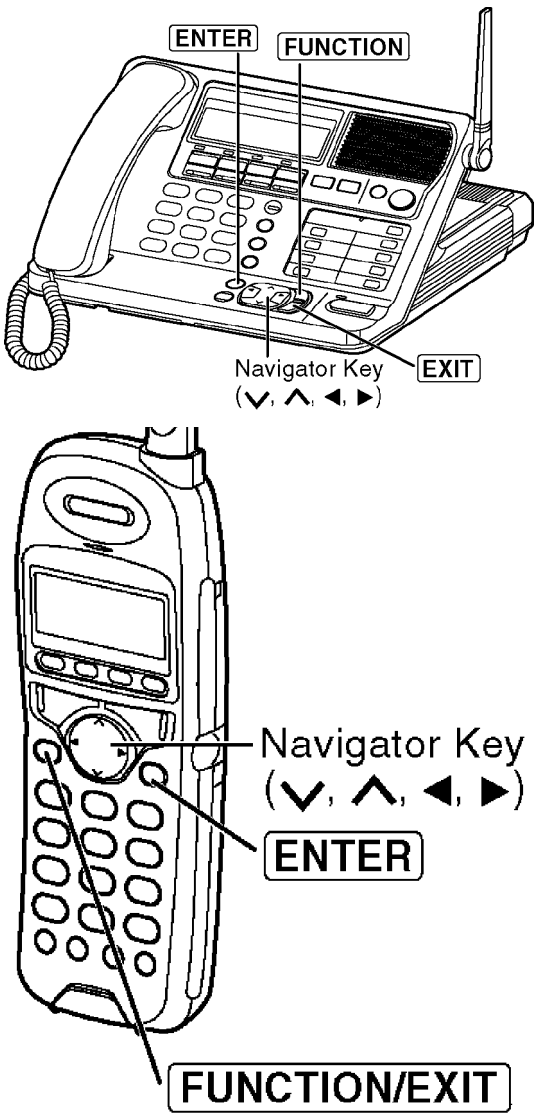
The charger can be wall mounted. / Install screws using the wall template on the right. Connect the AC adaptor. / Mount the charger, then slide it down.



1.4. Programmable Setting

1.4.1. Programming Guidelines Base Unit Handset

This unit has various programmable functions. Most of them are selected from the function menu on the display.

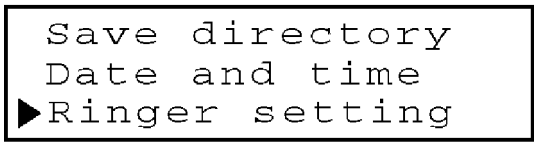


How to select a function item from the menu

1. **Press [FUNCTION] while in the standby mode. The main menu is displayed.**
2. **You can scroll through the menu by pressing ▼ or ▲. Find the desired item and point the arrow to the item by pressing ▼ or ▲.**

Base Unit

Ex. “Ringer setting” is at the arrow.



3. Press ▶ to select the item.

4. If the selected item has a sub-menu, it will be displayed. Select the sub-menu item by pressing ∨ or ∧, and press ▶.

5. You can then select the desired setting.

- **[ENTER] is used to select or save a programming setting.**

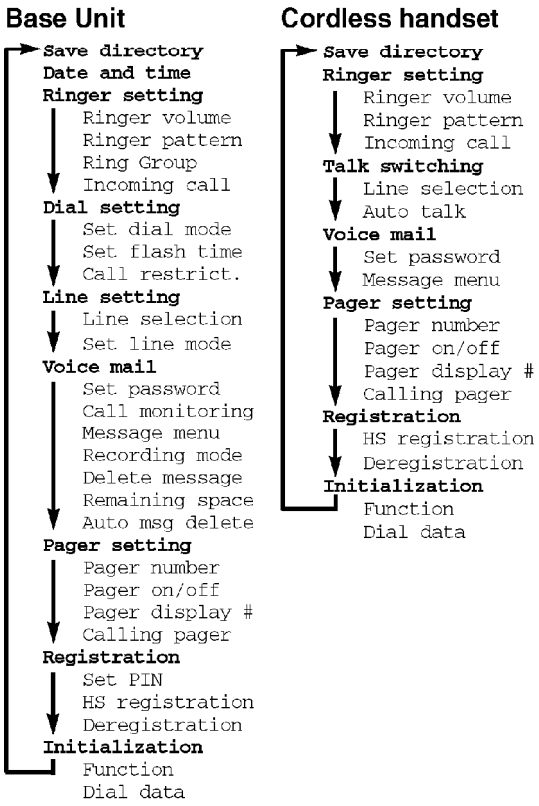
6. When programming is complete, a confirmation tone sounds. The display will return to the main menu or the sub-menu (if the function item is in the sub-menu). You can continue programming other items. To return to the standby mode, press [EXIT] .

Useful information:

- You can go back to the previous display by pressing ◀ except when entering characters or numbers. To return to the main menu from the sub-menu, press ◀.
- You can exit the programming mode any time by pressing [EXIT] .
- If you do not press any buttons for 60 seconds, the unit will return to the standby mode.
- If the unit detects a problem, an error message will be displayed.

1.4.2. Function Menu Table Base Unit Handset

You can use the following functions to customize your system according to your needs. After pressing [FUNCTION] , the main menu is displayed. Most items in the main menu have a sub-menu. The sub-menu is shown after selecting the item in the main menu.



1.4.3. Registering Optional Cordless Handsets

Base Unit & Handset

Registration is necessary for cordless handsets. You can register up to 8 cordless handsets at the base unit. The model number of the optional cordless handset is KX-TGA400B.
The included cordless handset is pre-registered at the factory and assigned the handset number 1. The handset number is used as the extension number. Optional handsets must be registered at the base unit. Only one handset can be registered at a time.
Make sure that the base unit and cordless handset are in the standby mode. Registration must be completed within 1 minute.

1. Base unit: / Press [FUNCTION] .

2. Press ⌄ or ⌃ until the arrow points to “Registration”, and press ▶.

3. Press ⌄ or ⌃ until the arrow points to “HS registration”, and press ▶.

```
Handset
registering
```

4. Cordless handset: / Press [FUNCTION] .

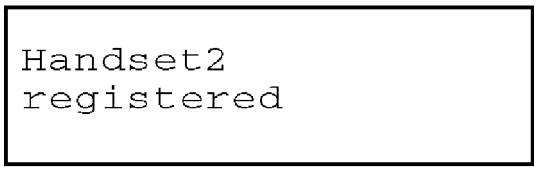
5. Press ⌄ or ⌃ until the arrow points to “Registration”, and press

▶.

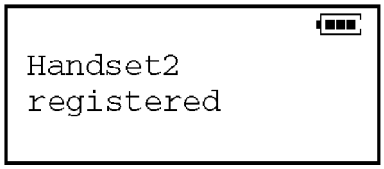
6. While “HS registration”, is at the arrow, press ▶.

7. Base unit/cordless handset:
Wait until a beep sounds on the base unit and handset and until both of the displays show the assigned handset number.
Ex. Handset number is 2.

Base Unit



Cordless Handset



- To return to the standby mode, press [EXIT] .
- The handset number ([1] to [8]) will be displayed on the handset.

You can store a PIN (Personal Identification Number) to prevent unauthorized persons from registering and using a cordless handset. / Once the PIN is set, you must enter the PIN at registration.

Base Unit

1.4.4. Selecting the Dialing Mode

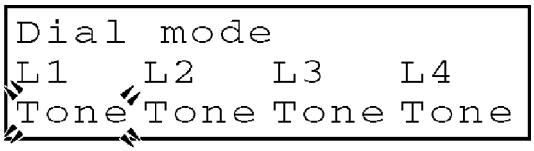
If your lines have touch tone service, set to “Tone”. If rotary or pulse service is used, set to “Pulse”. Select the mode for each line. Your phone comes from the factory set to “Tone”. Make sure that the base unit is in the standby mode.

1. Press [FUNCTION] .

2. Press ∨ or ∧ until the arrow points to “Dial setting” and press ▶.

3. While “Set dial mode” is at the arrow, press ▶.

- The current settings are displayed.



4. Select “Puls” (Pulse) or “Tone” by pressing ∨ or ∧ for each line.

To move to another line, press ▶ or ◀.

5. Press [ENTER] .

- A beep sounds.
- To return to the standby mode, press [EXIT] .

1.4.5. Selecting the Ringer Volume Base Unit Handset

You can set the base unit and cordless handset ringer volumes to HIGH, LOW or OFF. If set to OFF, the base unit/handset will not ring. Your phone comes from the factory set to HIGH. Programming must be carried out separately for the base unit and cordless handset(s). Make sure that the base unit/cordless handset is in the standby mode.

1. Press [FUNCTION] .

2. Press ∨ or ∧ until the arrow points to “Ringer setting”, and press ▶.

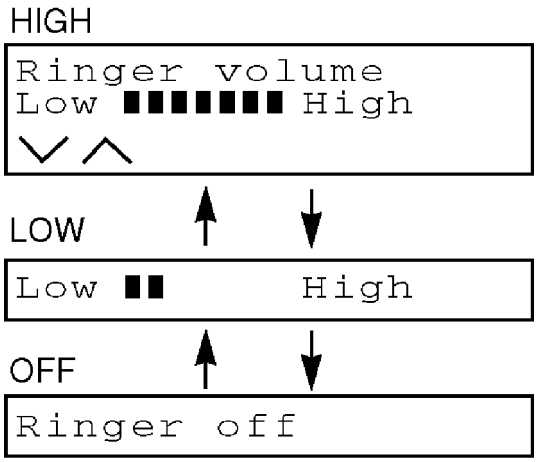
- The current volume is displayed.

3. While “Ringer volume” is at the arrow, press ▶.

- The current volume is displayed.

4. Press ∧ to increase or press ∨ to decrease the volume.

- Each time you press ∨ or ∧, the volume will change and ring.
- To turn the ringer OFF, press and hold ∨ until a beep sounds.



- To return to the standby mode, press [EXIT] .

- If set to OFF, “Ringer off” will be displayed in the standby mode.

To turn the ringer ON, press ^ in step 4.

- The ringer will sound at the LOW level.

- You can also select the ringer volume while a call is being received. Press v or ^ while the unit is ringing.

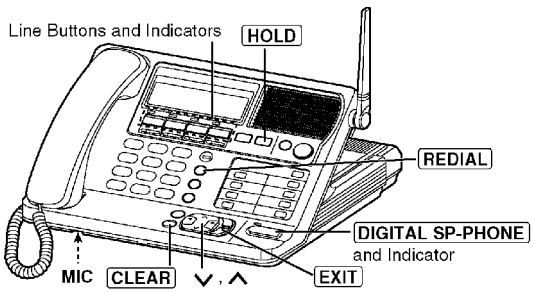
- To turn the ringer off for each line, use the ring group feature.

1.5. Making Calls Base Unit Handset

Four calls can be handled simultaneously on separate telephone lines by the base unit and 3 cordless handset (or by 4 cordless handsets).

1.5.1. With the Base Unit

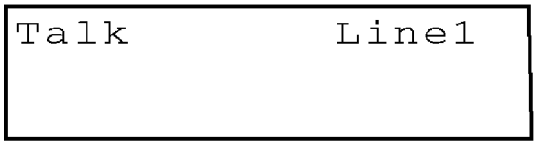
When you lift the handset to make a call, the unit will automatically select a free line. Dial a phone number. To hang up, replace the handset.



1.5.1.1. Using the Digital Duplex Speakerphone

1. Press [DIGITAL SP-PHONE] .

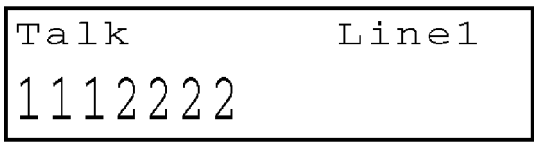
Ex. Line 1 is selected.



- The indicator lights.
- A free line is automatically selected and the line indicator lights.

2. Dial a phone number.

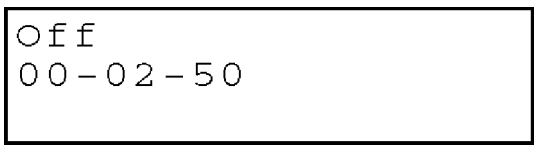
Ex. Line 1 is selected.



- The dialed number is displayed.
- If you misdial, press [DIGITAL SP-PHONE] , and start again from step 1.
- After a few seconds, the display will show the length of the call.

3. When the other party answers, talk into the MIC (microphone).

4. To hang up, press [DIGITAL SP-PHONE] .



- The indicator lights go out.

- In step 1, you can select a line by pressing a line button whose indicator is not lit, instead of pressing / [DIGITAL SP-PHONE] .
- If 4 handsets are in use, you may not be able to make a call. In that case "System is busy. Please try again later." is displayed.
- If the unit detects a problem, an error message will be displayed.

1.5.1.2. To dial After Confirming the Entered Number

1. Enter a phone number.

- If you misdial, press [CLEAR] . Digits are erased from the right.

- To cancel, press [EXIT] .

2. Lift the handset or press [DIGITAL SP-PHONE] .

- The line number is displayed.

- After a few seconds, the display will show the length of the call.

- You can press a line button instead of / [DIGITAL SP-PHONE] .

3. When the other party answers, talk into the handset or MIC.

4. To hang up, replace the handset or press [/ DIGITAL SP-PHONE] .

1.5.1.3. To Redial the Last Number Dialed

Lift the handset or press [DIGITAL SP-PHONE] , and press / [REDIAL] .

1.5.1.4. To Adjust the Handset Volume (High, Medium or Low) or the Speaker Volume (8 levels)

Press ^ or v while talking.

- Each time you press ^ or v, the volume level will change.

Ex. Handset volume: High

Ex. Speakerphone volume: 8

1.5.1.5. To Redial Using the Redial List

The last 10 phone numbers dialed with the base unit are stored in the redial list.

1. Press [REDIAL] .

- The last number dialed is displayed.

2. Press [REDIAL] until the desired number is displayed.

- You can scroll between numbers by pressing v or .^

- To exit the list, press [EXIT] .

3. Lift the handset or press [DIGITAL SP-PHONE] .

- To erase an item, repeat steps 1 and 2, and press [CLEAR] .

- If “No items stored” is displayed, the list is empty.

Hands-free Digital Duplex Speakerphone
For best performance, please note the following:

- **Talk alternately with the caller in a quiet room.**
- **If the other party has difficulty hearing you, press ⌄ to decrease the speaker volume.**
- **If the other party's voice from the speaker cuts in/out during a conversation, press ⌄ to decrease the speaker volume.**
- **You can switch to the handset by lifting it up. To switch back to the speakerphone, press [DIGITAL SP-PHONE] .**

1.5.1.6. To Put a Call on Hold

Press [HOLD] .

- "Hold" and the line number are displayed.
- If using the handset, you can replace it on the cradle.
- If a call is kept holding for 30 seconds, a warning tone will sound. After 2 minutes the automated attendant will respond to the caller and he/she can call a handset or leave a message following the Incomplete Call Handling Menu.

1.5.1.7. To Release the Hold

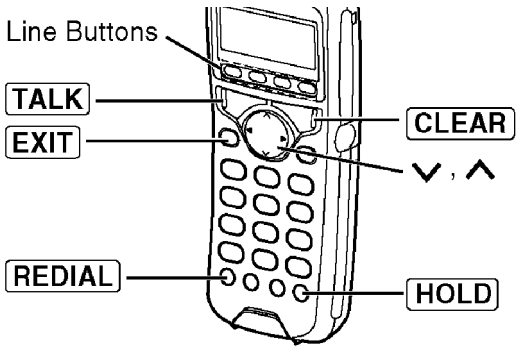
Press the line button whose indicator is flashing.

- Cordless handset users can release the hold by pressing the line button. If another phone is connected on the same line, the hold will also be released by lifting its handset.

1.5.1.8. What Line Indicators Mean

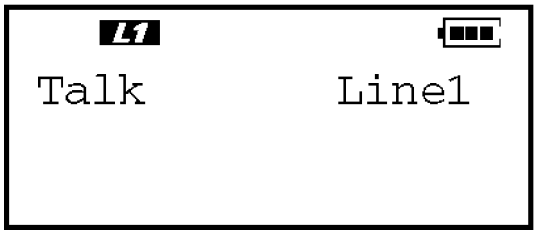
Off	**The line is free.**
On	**The line is being used.**
Flashing	**A call is on hold. The Automated Attendant System or Answering System is responding to a call.**
Flashing quickly	**A call is being received.**

1.5.2. With the Cordless Handset



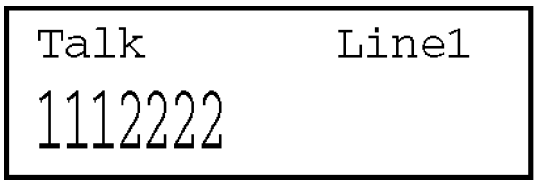
1. Press [TALK] .

Ex. Line 1 is selected.



- A free line is automatically selected and the line status icon is displayed.

2. Dial a phone number.



- The dialed number is displayed.

- After a few seconds, the display will show the length of the call.

3. To hang up, press [TALK] or place the handset on the charger.

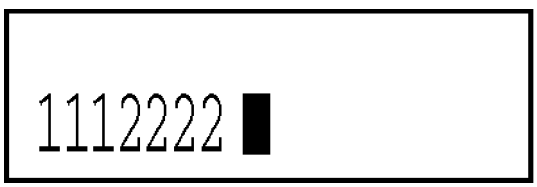
- In step 1, you can select a line by pressing the line button whose line status icon is not displayed, instead of pressing / [TALK] .

- If the base unit and 3 other handset or 4 other handsets are in use, you may not be able to make a call. In the case “System is busy.Please try again later.” is displayed.

- If the unit detects a problem, an error message will be displayed.

1.5.2.1. To Dial After Confirming the Entered Number

1. Enter a phone number.



- If you misdial, press [CLEAR] . Digits are erased from the right.

- To cancel, press [EXIT] .

2. Press [TALK] .

- **You can press a line button instead of pressing [/ TALK] .**
- **The line number is displayed.**
- **After a few seconds, the display will show the length of the call.**

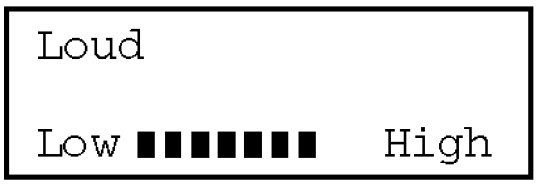
3. To hang up, press [TALK] or place the handset on the charger.

1.5.2.2. To Adjust the Receiver Volume (High, Medium or Low)

Press ^ or v while talking.

- Each time you press ^ or v, the volume level will change.

Ex. High



1.5.2.3. Lighted Handset Keypad

The handset dialing buttons will light when you press a button, and flash when a call is received. The lights will go out about 10 seconds after pressing a button, lifting the handset off the charger or answering a call.

1.5.2.4. To Redial the Last Number Dialed

Press [TALK] and press [REDIAL] .

1.5.2.5. To Redial Using the Redial List

The last 10 phone numbers dialed with the handset are stored in the redial list.

1. Press [REDIAL] .

- **The last number dialed is displayed.**

2. Press [REDIAL] until the desired number is displayed.

- **You can scroll between numbers by pressing v or .^**
- **To exit the list, press [EXIT] .**

3. Press [TALK] .

- To erase an item, repeat steps 1 and 2, and press [CLEAR] .
- If "No items stored" is displayed, the list is empty.

1.5.2.6. To Put a Call on Hold

Press [HOLD] .

- "Hold" and the line number are displayed.
- The line status icon flashes on the display.
- If a call is kept holding for 30 seconds, a warning tone will sound. After 2 minutes the automated attendant will respond to the caller

and he/she can call the base unit or another handset or to leave a message following the Incomplete Call Handling Menu.

1.5.2.7. To Release the Hold

Press the line button.

- The base unit and other handset users can release the hold by pressing the line button. If another phone is connected on the same line, the hold will also be released by lifting its handset.

1.6. Answering Calls Base Unit Handset

Four calls can be handled simultaneously by the base unit and 3 cordless handsets (or by 4 cordless handsets). When a call is being received, the unit rings and "Incoming call" is displayed. The called line indicator flashes quickly on the base unit and the line status icon flashes quickly on the handset display. The line is automatically selected when you answer the call. If you subscribe to a Caller ID service, the calling party information will be displayed after the first ring. In order to view the Caller ID information, please wait until the second ring to answer a call.

1.6.1. With the Base Unit

You can answer a call by simply lifting the handset. To hang up, replace the handset.

1.6.1.1. Using the Digital Duplex Speakerphone

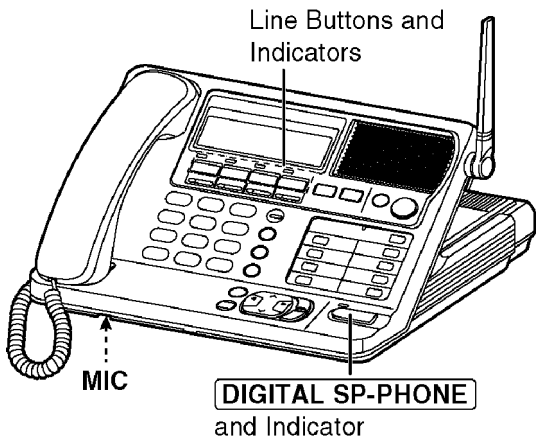
1. Press [DIGITAL SP-PHONE] .

- The indicator lights.
- The called line indicator light stops flashing.

2. Talk into the MIC (microphone).

3. To hang up, press [DIGITAL SP-PHONE] .

- The indicator lights go out.



1.6.2. With the Cordless Handset

Press [TALK] .

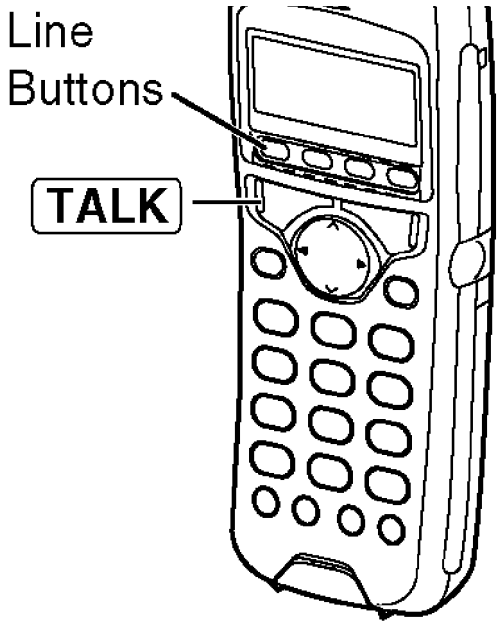
- The called line status icon stops flashing.

- You can also answer a call by pressing any dialing button / [0] to [9] , [*] or [#] (—Any Key Talk).

OR

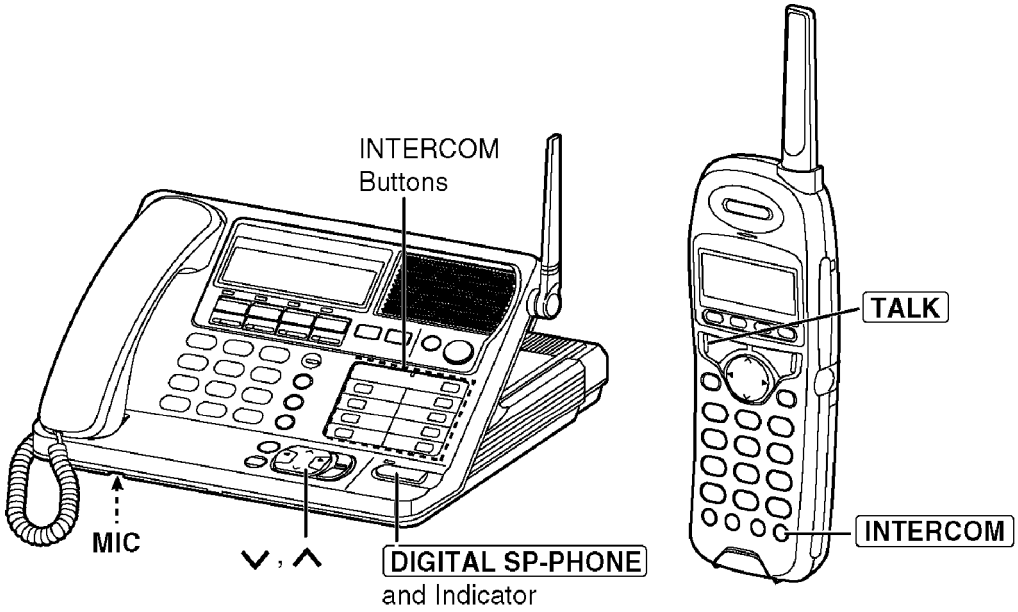
If the handset is on the charger, just lift up. (This is not possible when the Auto Talk feature is set to OFF.)

> **-You can answer a call by pressing the called line button instead of pressing [DIGITAL SP-PHONE] or [TALK] .**
>
> **-When the base unit and handset ringer volumes are set to OFF, they will not ring.**



1.7. Intercom Base Unit Handset

A 2-way intercom is possible between the base unit and a cordless handset or between two cordless handsets. Each number assigned to a handset at registration is the extension number. The base unit extension number is 0.



1.7.1. Making Intercom Calls

1.7.1.1. With the Base Unit

1. To page all handsets, press INTERCOM [ALL] . To page one handset, press the corresponding INTERCOM button ([1] to [8]).

Ex. Paging all Handsets

```
Paging[ALL]
```

Ex. Paging Handset 1

```
Calling[0]→[1]
```

- The paged handsets ring for 1 minute.
- To stop paging, press [DIGITAL SP-PHONE] .

2. When the other party's voice is heard, lift the handset or talk into the MIC (microphone).

Ex. Handset 1 answered.

```
Intercom
00-00-00
```

- The display will show the length of the call and the handset in-

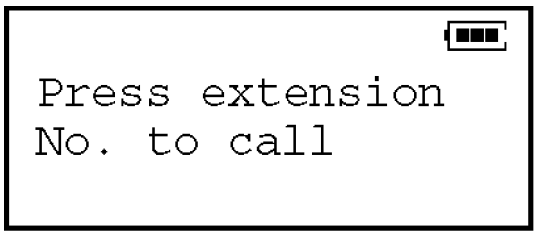
use icon.

3. To end the intercom, replace the handset or press [DIGITAL SP-PHONE] .

- If you page all handsets, you can only talk with the handset user who answers first.
- Using this feature, you can locate a misplaced cordless handset.

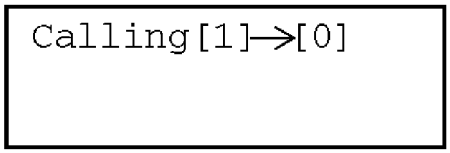
1.7.1.2. With the Cordless Handset

1. Press [INTERCOM] .



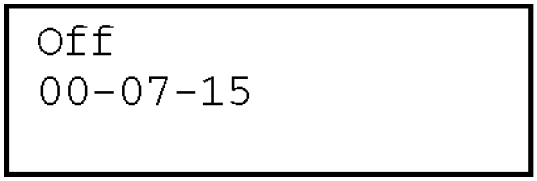
2. To page the base unit, enter [0] . To page another handset, enter the extension number ([1] to [8]).

Ex. Handset 1 paging Base Unit



- The base unit or the paged handset rings.
- To stop paging, press [INTERCOM] .
- After the paged party answers, the display will show the length of the call.

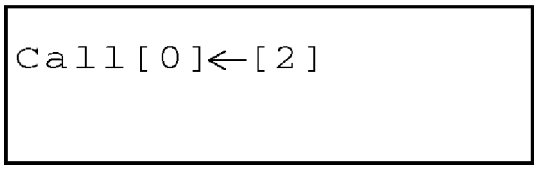
3. To end the intercom, press [TALK] or place the handset on the charger.



1.7.2. Answering Intercom Calls

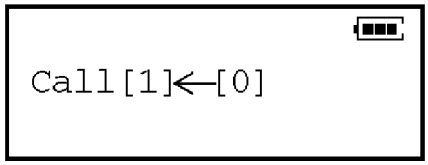
With the base unit:
After the rings, lift the handset or press / [DIGITAL SP-PHONE] .
To end the intercom, replace the handset or press / [DIGITAL SP-PHONE] .

Ex. Handset 2 paging



With the cordless handset:
After the rings, press [TALK] or lift the handset off the charger.
To end the intercom, press [TALK] or place the handset on the charger.

Ex. Base Unit paging Handset 1



During an intercom call:

-If an incoming call is being received, the line indicator on the base unit will flash quickly or the handset user will hear two tones (incoming call tone).
To answer, press the relevant line button.

-If the unit detects a problem, an error message will be displayed.

- When the base unit and handset ringer volumes are set to OFF, they will not ring.

1.8. Transferring a Call Base Unit Handset

You can transfer an external call between the base unit and a cordless handset, or between two cordless handsets.

1.8.1. With the Base Unit

1. During a call, press the corresponding TRANSFER button ([1] to [8]) to page the handset. / To page all handsets, press TRANSFER [ALL] .

- The call is put on hold and the line indicator flashes.

2. If required, wait for the handset user to answer, and you can announce the transfer. / If not required, go to step 3.

   - If the paged party does not answer, press the relevant line button.

3. To complete the transfer, replace the handset or press / [DIGITAL SP-PHONE] .

To answer a transferred call with the base unit:
Lift the handset or press [DIGITAL SP-PHONE] after the rings.

- After the paging party hangs up, you can talk to the outside caller.
- You can press the relevant line button instead of pressing / [DIGITAL SP-PHONE] to talk to the outside caller.

1.8.2. With the Cordless Handset

1. During a call, press [TRANSFER] .

   - The call is put on hold and “Press extension No. to transfer” is displayed.

2. To page the base unit, enter [0] . / To page another handset, enter the extension number ([1] to [8]).

3. If required, wait for the paged party to answer, and you can announce the transfer. / If not required, go to step 4.

   - If the paged party does not answer, press the relevant line button.

4. To complete the transfer, press [TALK] or place the handset on the charger.

To answer a transferred call with the cordless handset:
Press [TALK] or lift the handset off the charger after the rings.

- After the paging party hangs up, you can talk to the outside caller.
- You can press the relevant line button instead of pressing / [TALK] to talk to the outside caller.
- If the paged party does not answer within 30 seconds after you hang up, the transferred call will be returned to you. Press the relevant line button to take the call. If you do not answer the recalled call within 2 minutes, the automated attendant will

respond to the caller and he/she can call the base unit or a handset or leave a message following the Incomplete Handling Menu.

- Any users can take a transferred call by pressing the relevant line button.

2. DISASSEMBLY INSTRUCUTIONS

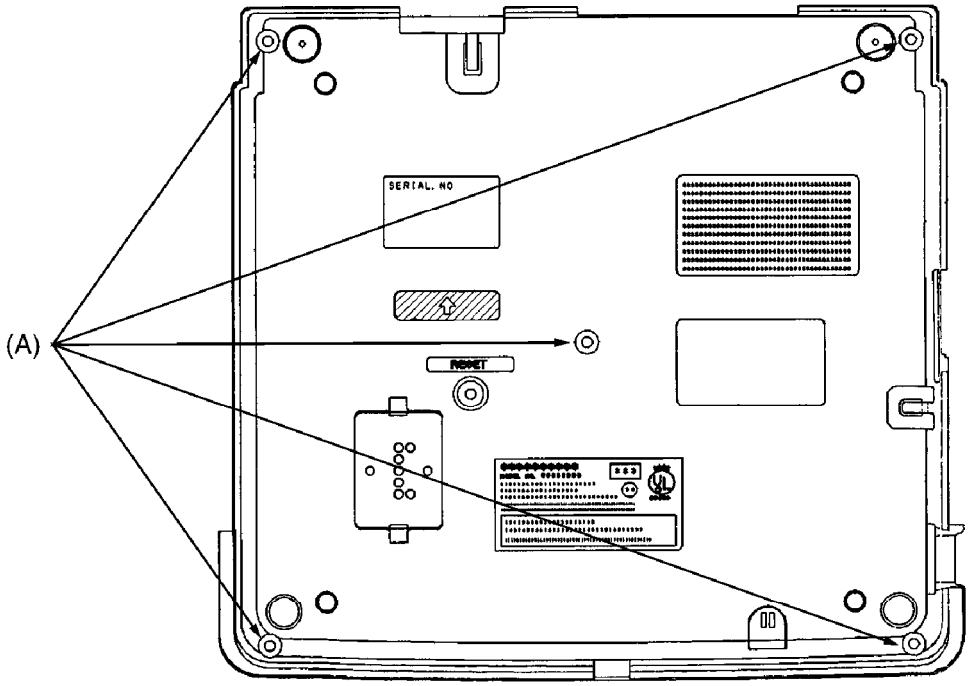
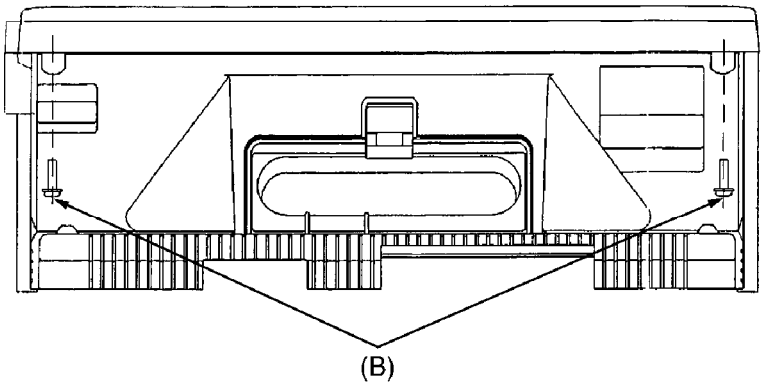
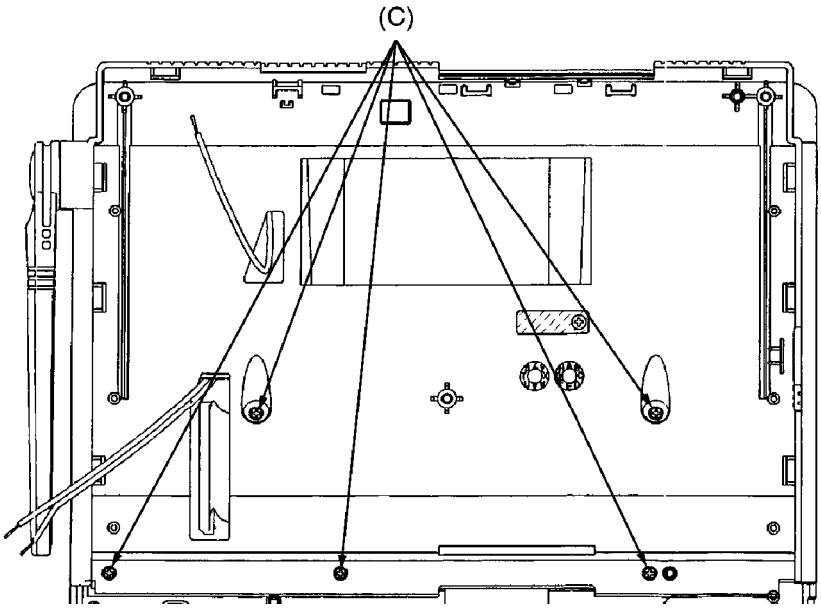


Fig. 1





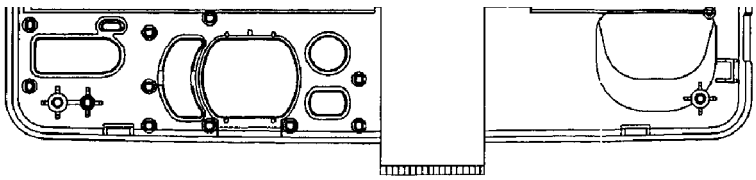


Fig. 2

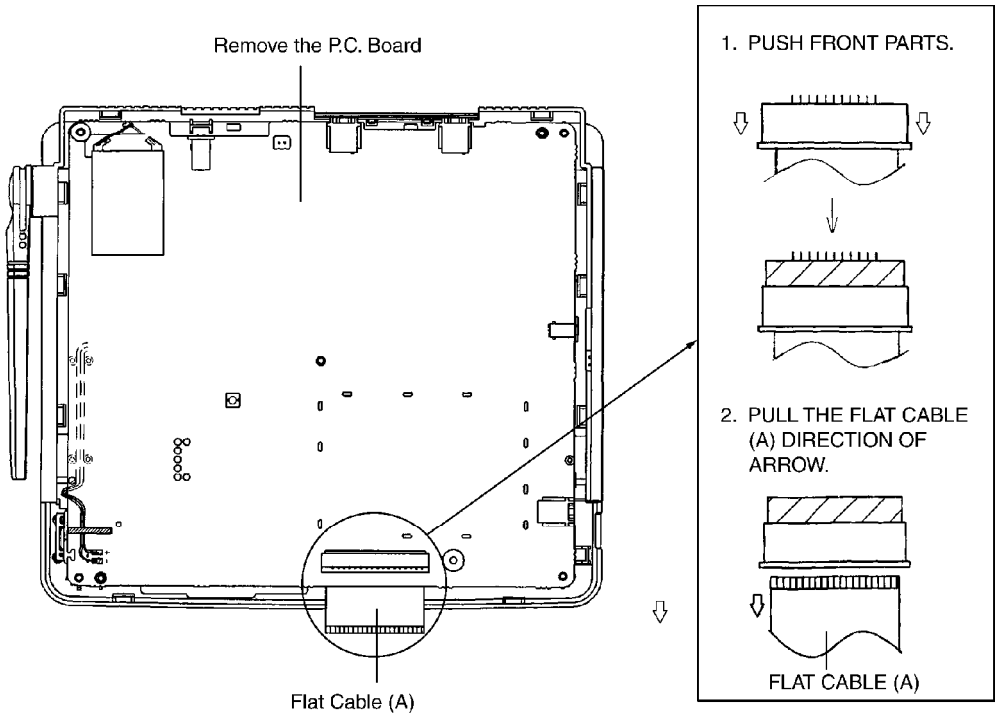


Fig. 3

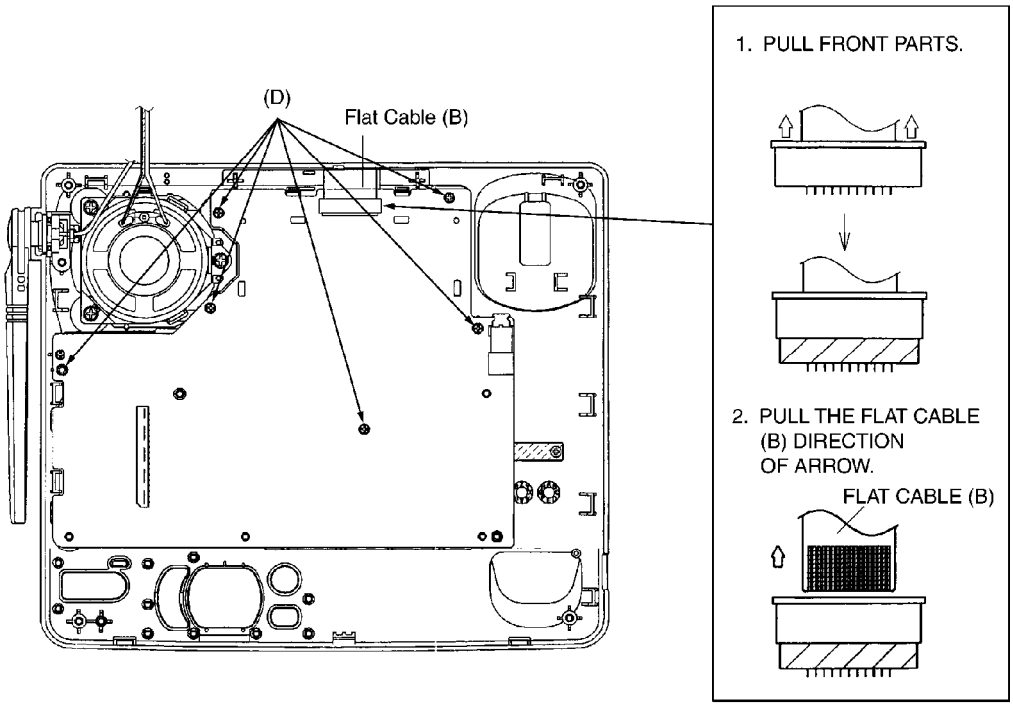


Fig. 4

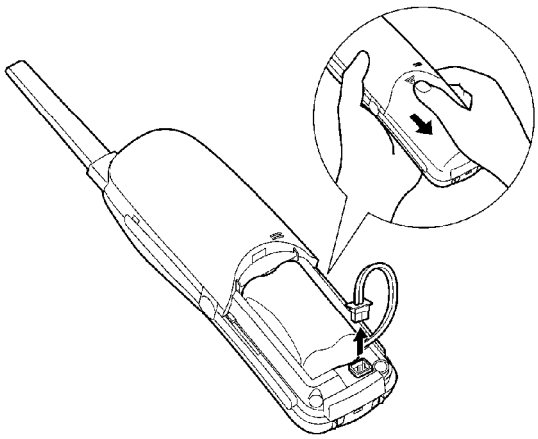


Fig. 5

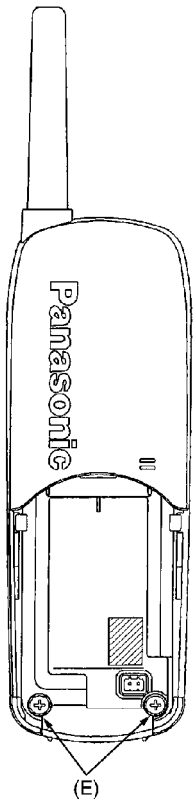
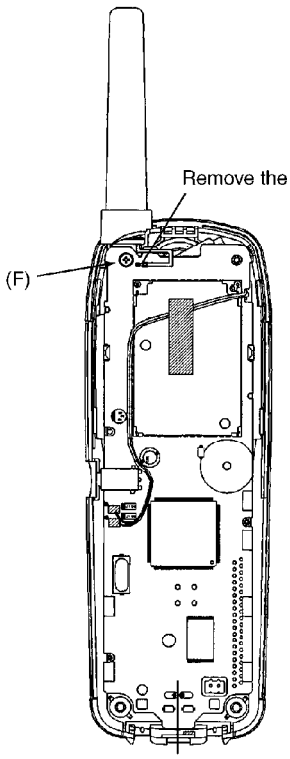


Fig. 6



Remove the P.C. Board

Fig. 7

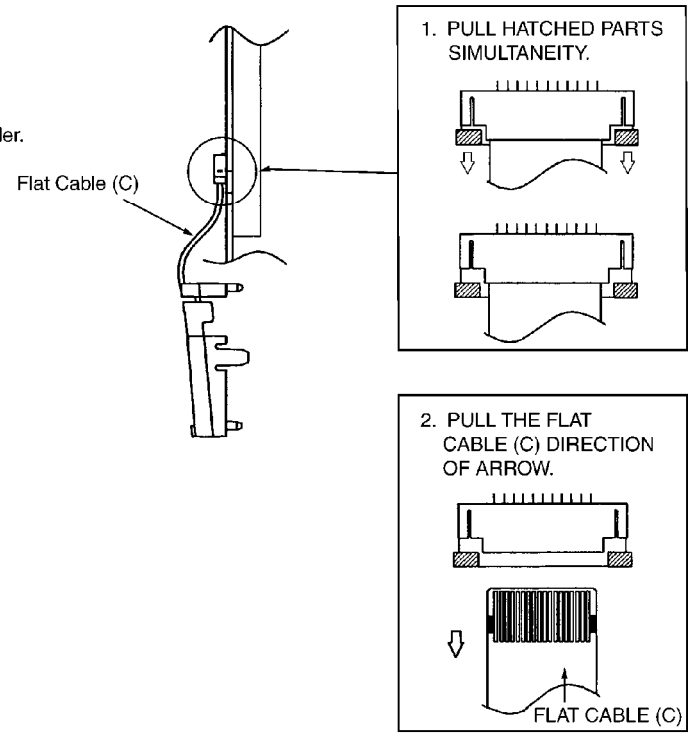


Fig. 8

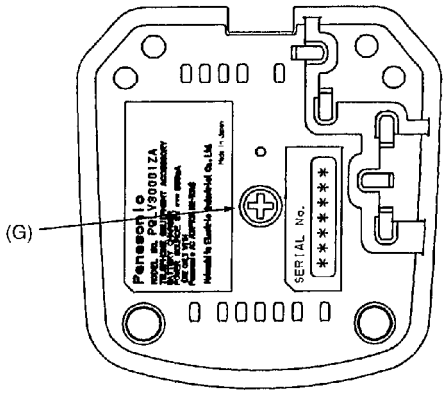


Fig. 9

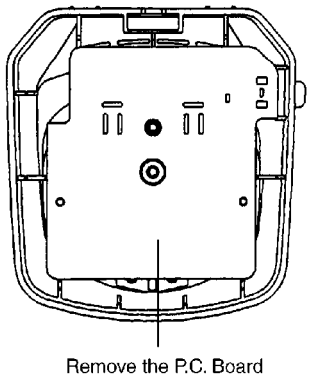


Fig. 10

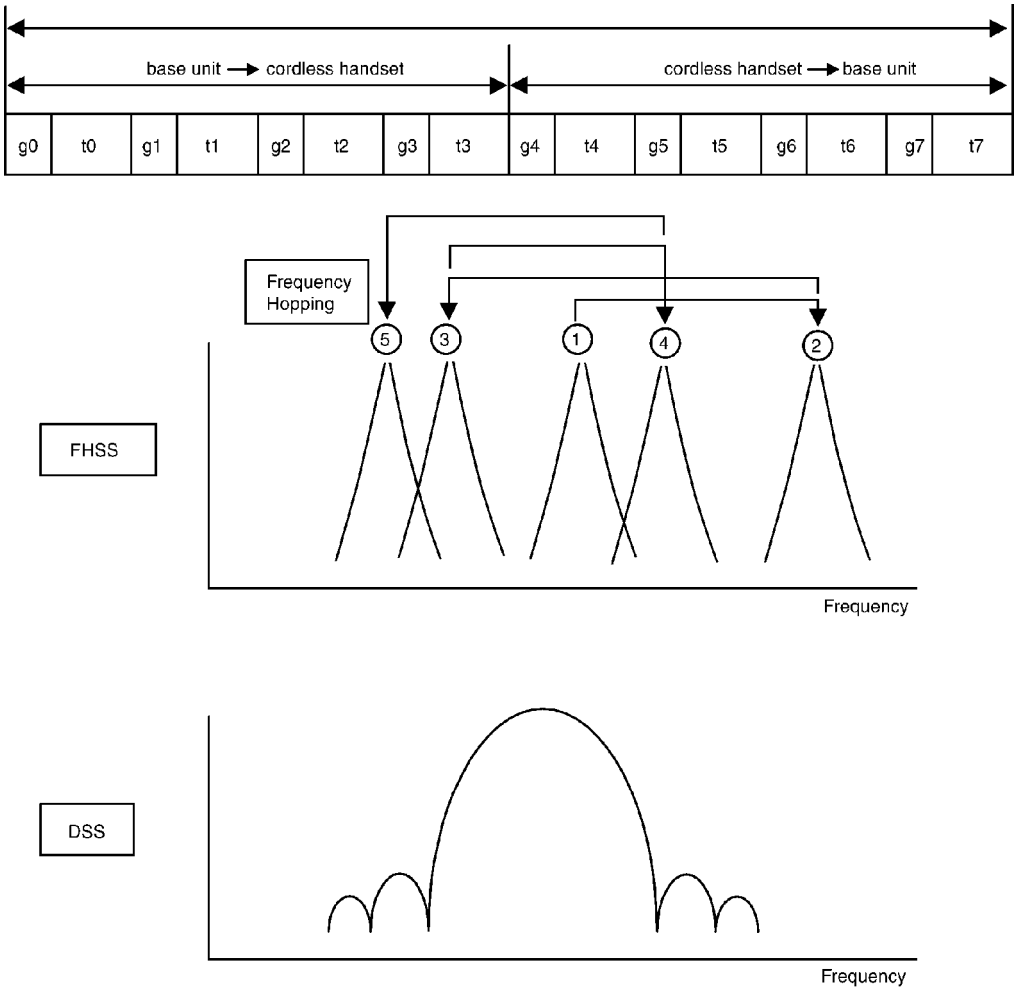
Ref. No.	Procedure	Shown in Fig -.	To remove -.	Remove -.
1	1	1	Lower Cabinet	Screw (3×14).....(A)×5
2	1~3	2	Upper Cabinet	Screw (3×10).....(B)×2
3				Screw (3×10).....(C)×5
4	1~5	3	Main P.C.Board	Remove the Flat Cable (A
5				Remove the P.C.Board
6	1~6	4	Operational P.C.Board	Screw (3×10).....(D)×6
7	1~7	4	Operational P.C.Board	Remove the Flat Cable (E
8	8	5	Battery Cover	Remove the Battery Cove
9	8, 9	6	Rear Cabinet	Screw (2.6×10).....(E)×2
10	9~12	7	P.C.Board	Remove the Solder
11				Screw (2.6×10).....(F)×1
12				Remove the P.C.Board
13	9~13	8	LCD Flat Cable	Remove the Flat Cable (C
14	14	9	Lower Cabinet	Screw (3×10).....(G)×1
15	14, 15	10	P.C.Board	Remove the P.C.Board

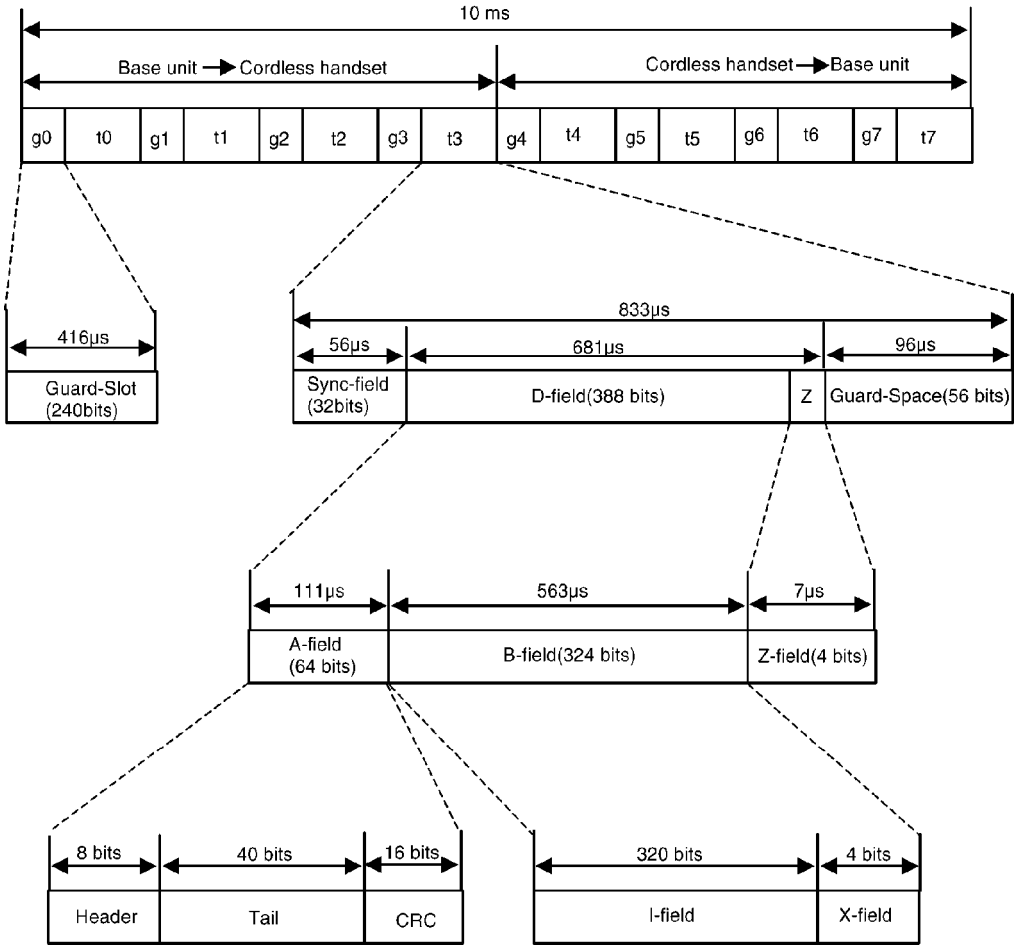
3. EXPLANATION OF THE DIGITAL TELECOMUNICATION TECHNOLOGY (FHSS, IOM-2, PCM, IPC)

3.1. FHSS (Frequency Hopping Spread Spectrum)

This telephone is using IC chip for WDTC (World Digital Cordless Telephone) and is the cordless telephone system that can use multiple portable unit simultaneously. The explanation of this system is mentioned as below. / This system uses a Time Division Multiple Access/Time Duplex (TDMA/TDD) scheme that transmitting and receiving frequency of the base unit and cordless handset is shared in the same frequency. The construction of data in frequency that is sent and received is as below. It consists of 4 slots from the base unit to the cordless handset, and 4 slots from the cordless handset to the base unit, total 8 slots in 10ms. (Signal area is "t", "g" area is called as guard slot.) / By this slot system, simultaneous air link and communication between 4

cordless handsets and the base unit can be realized. One communication between cordless handset and the base unit is done by one slot from the base unit to cordless handset, and one slot from cordless handset to the base unit. / DSS makes spectrum spread by multiplying carrier signal by PN code. / The purpose to make spectrum spread is to reduce power density per time and per band. / On the other hand, FHSS makes spectrum spread by changing channel every 10 ms according to PN code. Also the purpose to make spectrum spread is to reduce power density per time and per band.

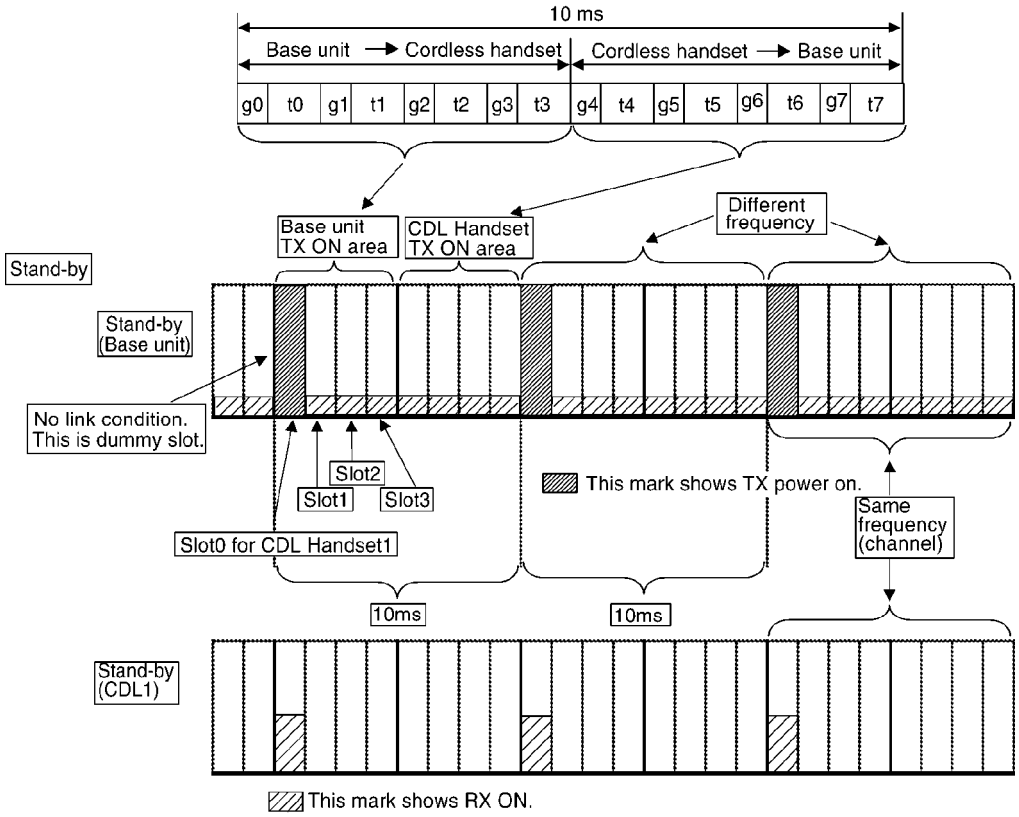




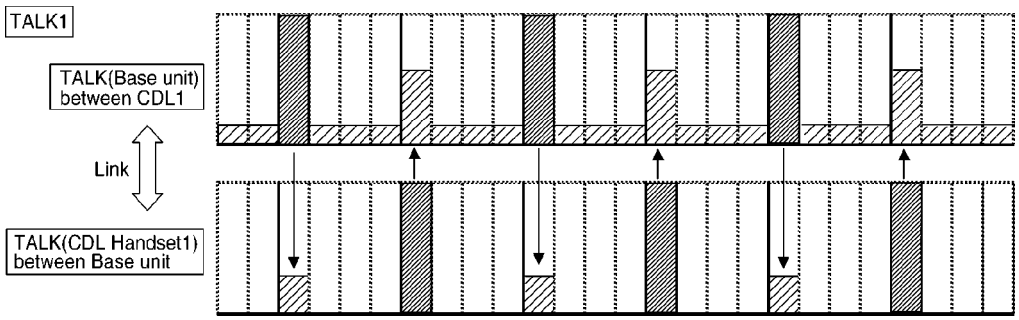
A-field
Each kinds of DATA: ch data, line condition, etc.

B-field
Acoustic DATA

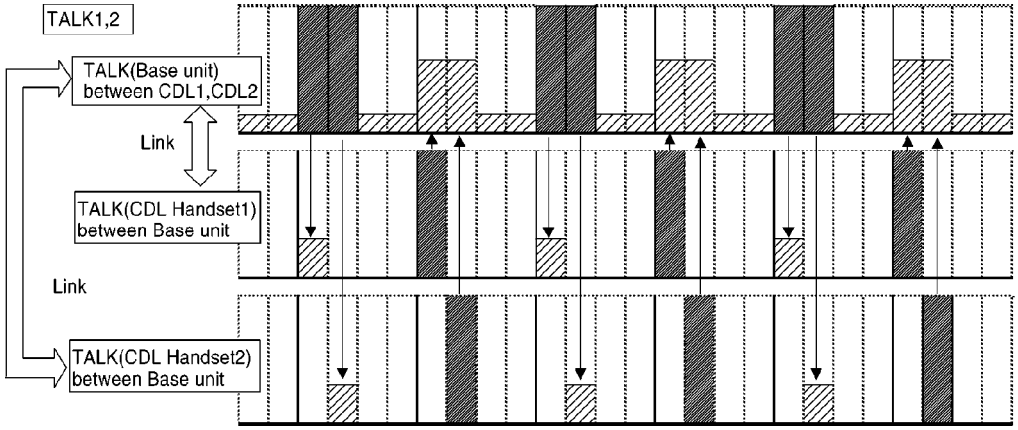
Sync-field
Base unit (cordless handset) adjusts the timing of reception so that reception of base unit (cordless handset) can correspond to transmission of cordless handset (base unit).
It is necessary for sync-field that cordless handset gets synchronization.



When cordless handset is synchronized with base unit at stand-by mode, cordless handset is in LC Duty Cycle) mode. In this mode, power consumption is low. While cordless handset is in stand-by r base unit send line information and bell information to cordless handset.



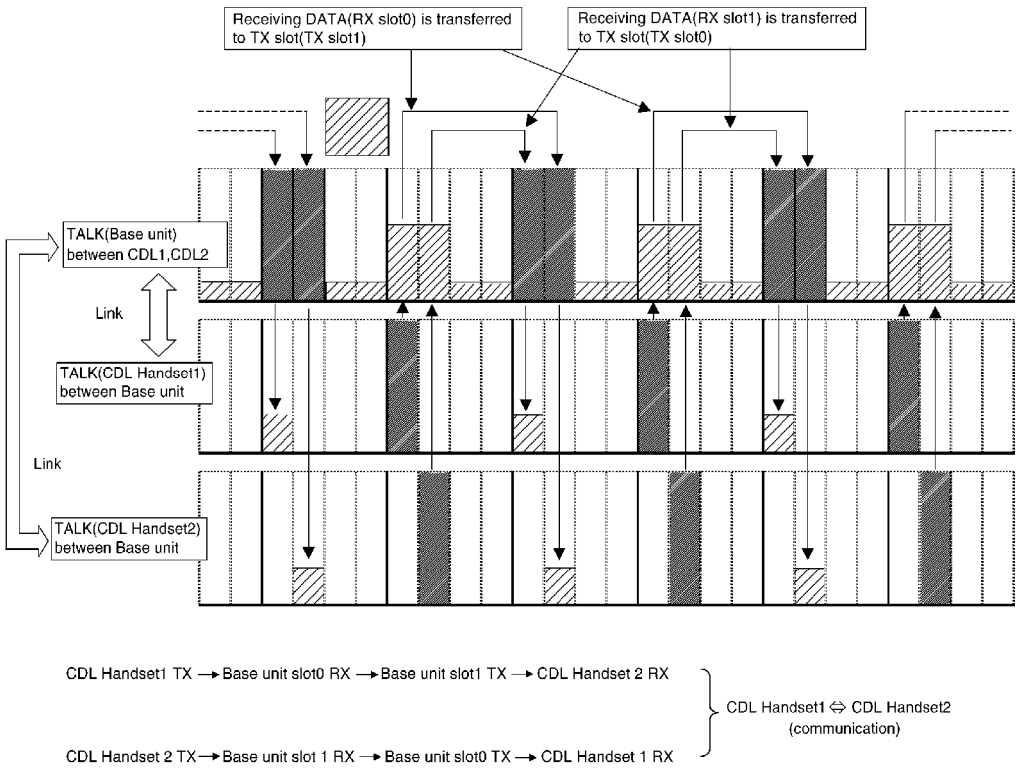
When user communicate with other party by cordless handset, cordless handset is sending and re like upper figure.



When user1 and user2 communicate with each other party, slots for transmission and reception of unit is used simultaneously. / This communication can be done up to 4 pairs of communication.

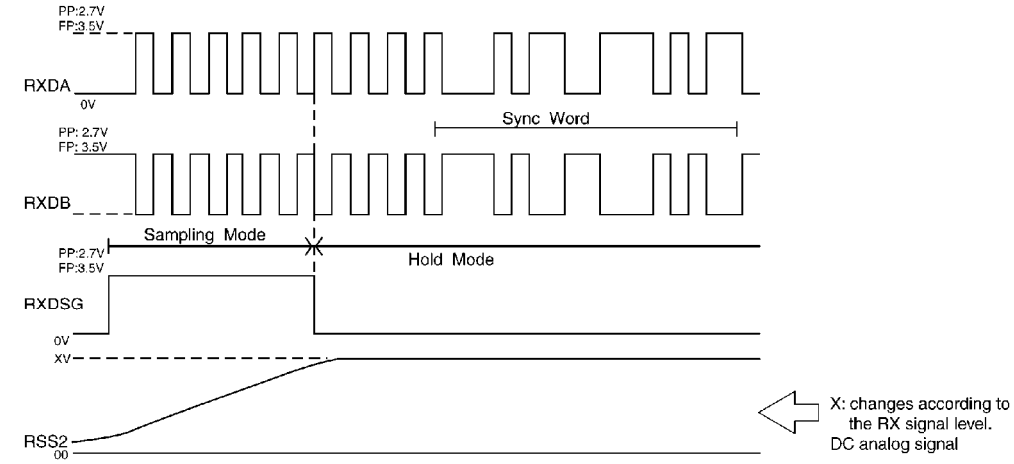
3.1.1. Intercom between CDL Handset1 and CDL Handset2

Intercom communication between CDL Handset1 and CDL Handset2 is carried out by below system.


Receiving DATA(RX slot0) is transferred
to TX slot(TX slot1)
Receiving DATA(RX slot1) is transferred
to TX slot(TX slot0)
TALK(Base unit)
between CDL1,CDL2
Link
TALK(CDL Handset1)
between Base unit
Link
TALK(CDL Handset2)
between Base unit
CDL Handset1 TX → Base unit slot0 RX → Base unit slot1 TX → CDL Handset 2 RX
CDL Handset 2 TX → Base unit slot 1 RX → Base unit slot0 TX → CDL Handset 1 RX
CDL Handset1 ⇔ CDL Handset2
(communication)

Intercom between 2 cordless handsets through base unit can be done like the upper figure by usin of slot.

3.1.2. Rx Data Wave (when synchronized)



(Receiving Signal strength Indicator)

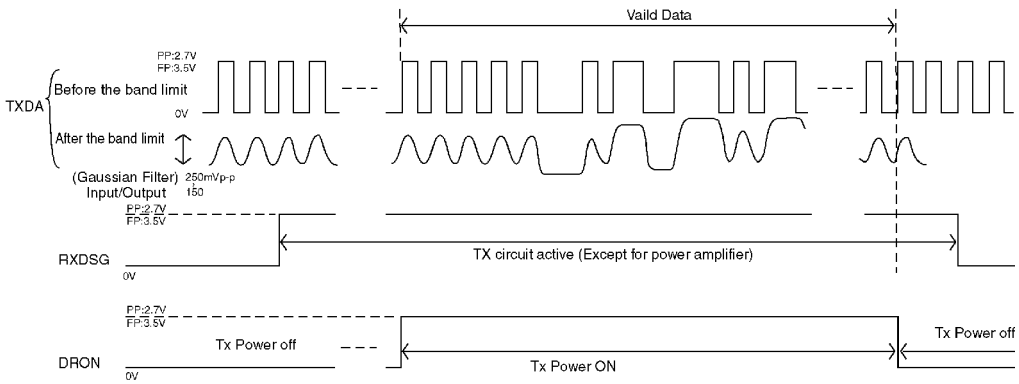
(RX)

When Preamble data (0101-0101) is received, based on the receiving wave it goes into the mode which decides the data judging level (the comparator reference level) while RXDSG is "High". → Sampling Mode

When the received preamble data (0101-0101) reached to about 8 bits, RXDSG goes to Low from High and it stops sampling to determine the data judging level. Then data reading is started. → Hold Mode

The unit enters the Hold mode, and the data will be synchronizes as soon as the sync. word is gained.

3.1.3. Tx Data Wave

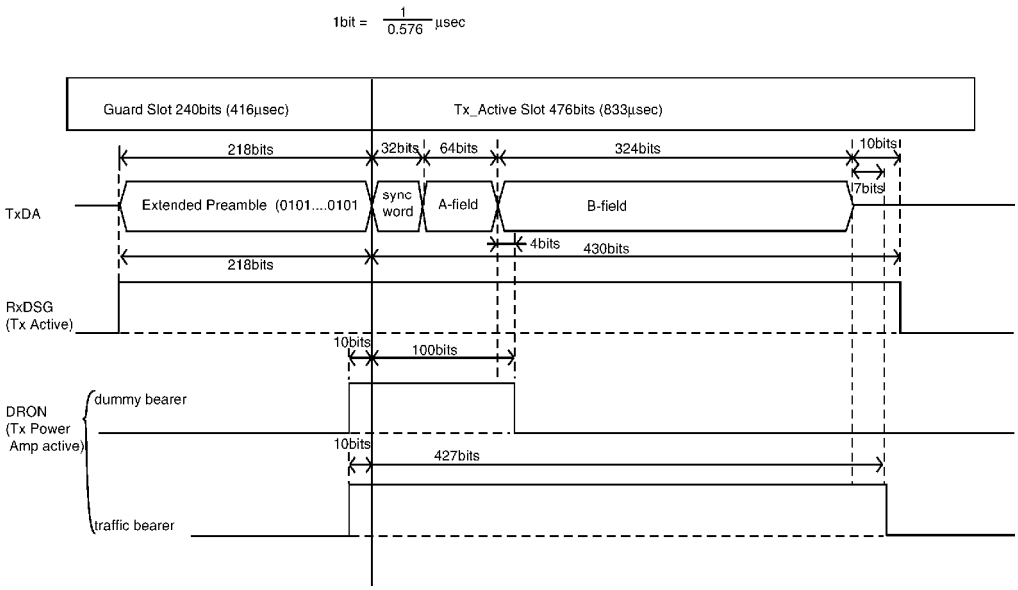


(TX)

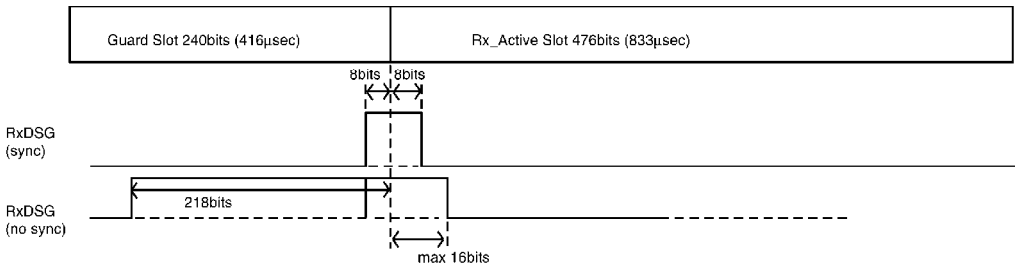
The transmitting circuit is activated with RXDSG "H". (The data is not transmitted because TX Final power amplifier is OFF.)

When DRON becomes "H", the Final power amplifier is turned ON to start transmitting.

3.1.4. Tx Slot Timing

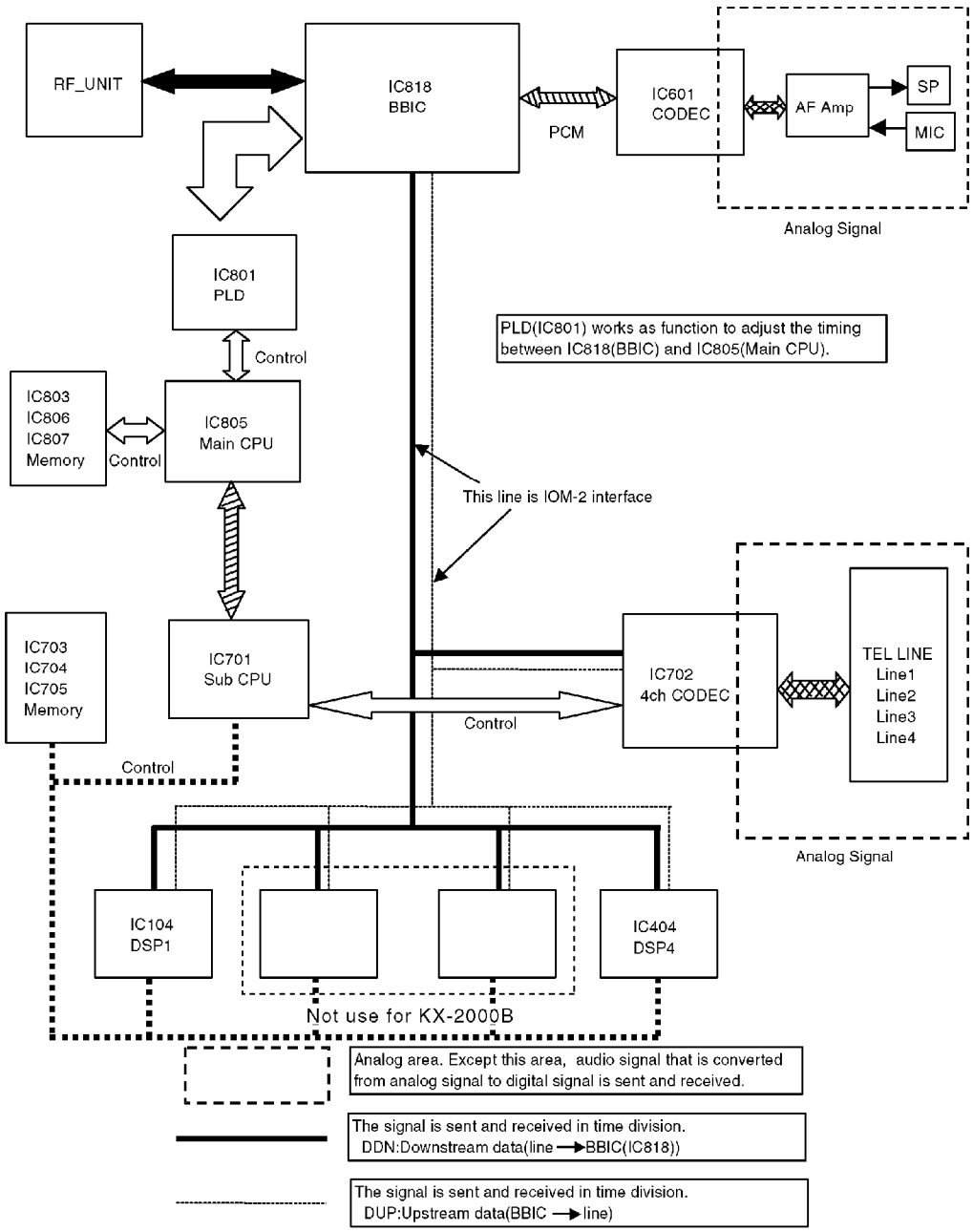


3.1.5. Rx Slot Timing



When the preamble of about 8 bits is found in no sync., the Sample mode turns to the Hold mode. Then it returns to the sample mode if the sync. word can not be found.

3.2. IOM-2 Interface



IOM-2 interface

This interface will be used to interface IC818(Base band) to the application area (DSP, 4ch CODEC) and to connect IC818(Base band) to the interface CODECs and the TAM DSPs. / In this model, IOM-2 interface is used to interface IC818(Base band) to 4-channel CODEC and 4 DSPs.

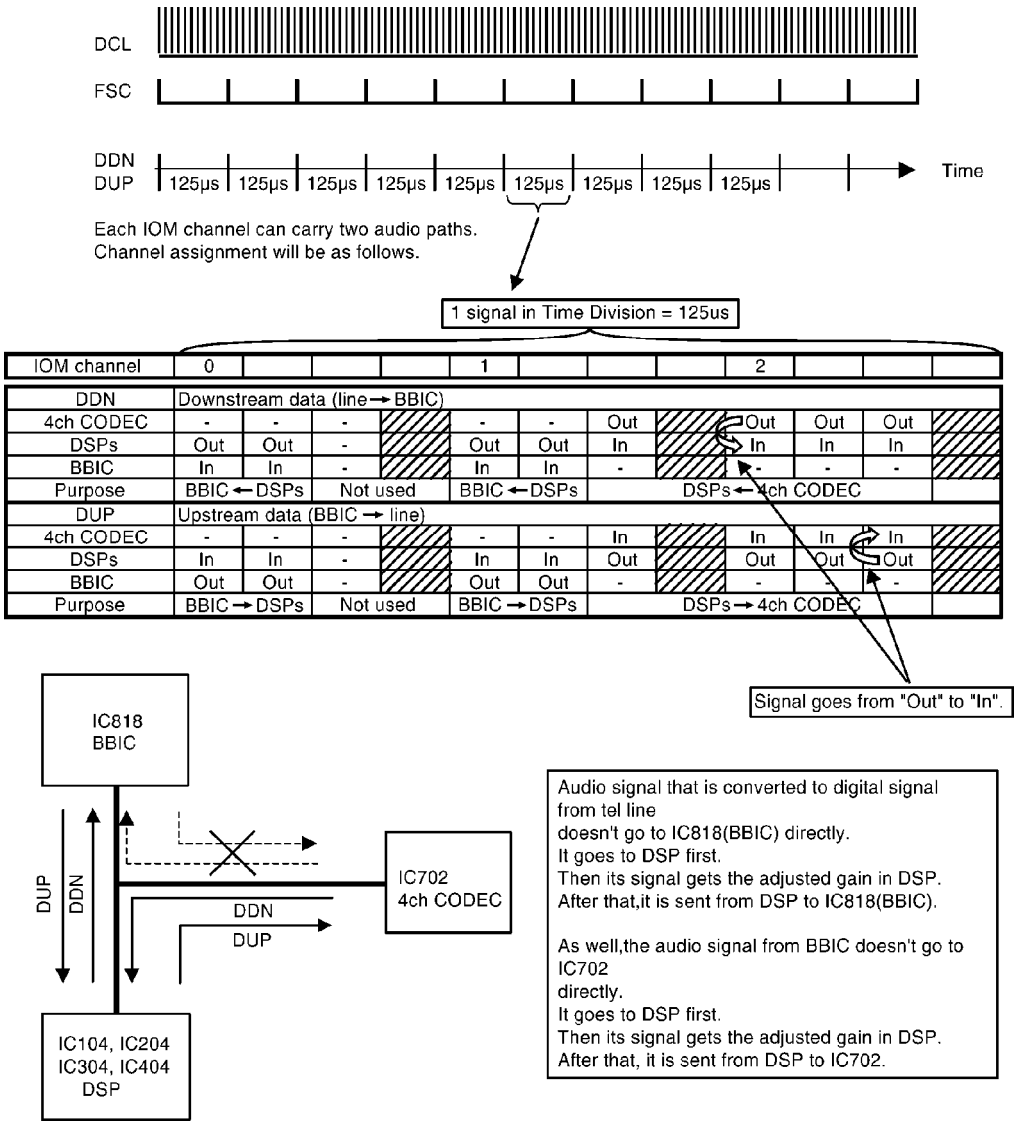
IOM-2:
This standard defines an industry standard serial bus for interconnecting telecommunications ICs. covers line card, and terminal architectures for ISDN and analog loop applications. / IOM-2 is revise IOM(ISDN Oriented Modular Interface).

ISDN:
Integrated Service Digital Network

IOM-2 interface consists of the following signals.

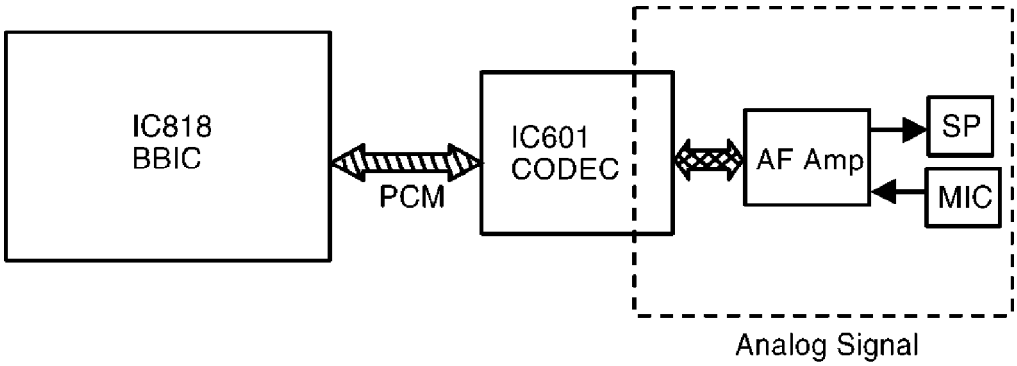
Signal	Direction with respect to protocol board	
DDN	Input	Data downstream, from BBIC to 4ch CODEC through DSI
DUP	3-state output	Data upstream, from 4ch CODEC to BBIC through DSP / except in selected time slots.
DCL	Output	IOM clock, 1536 kHz (two clocks per bit)
FSC	Output	Frame sync signal, 8 kHz

***Digital signal that is generated in Time Division is sent and received every time of 8 kHz (125 μs).**



3.3. PCM Interface

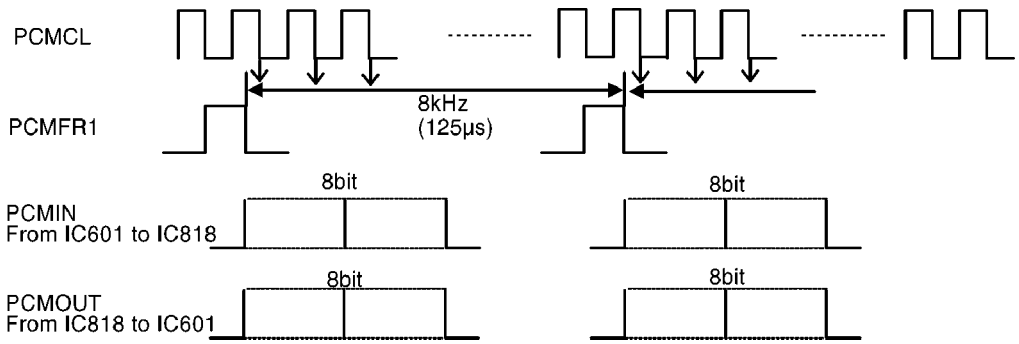
The PCM interface is used to connect the CODEC IC (IC601) that convert the audio signal to handset and speakerphone from digital to analog or from analog to digital to BBIC (IC818).



The interface consists of the following signals.

Signal	Direction	Function
PCMIN	From IC601 to IC818	Data
PCMOUT	From IC818 to IC601	Data
PCMCL	From IC818 to IC601	Clock, 1.536 MHz
PCMFR1	From IC818 to IC601	Frame signal,8kHz,indicates the time slot in the PCM stream in which the voice should be driven.

Timing PCM-Interface

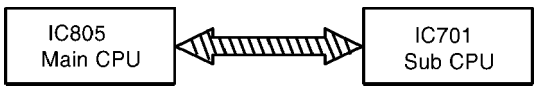


PCM data between IC601 and IC818 is received and transmitted in 8 bits every 125 μ s, simultaneously. PCM data is received and transmitted.

3.4. IPC Interface

This base unit has two CPUs. / Mainly main CPU (IC805) has the function to control IOM-2, baseband and RF. / Sub CPU (IC701) has the function to control the application area of DSP, key matrix, line control (caller-ID, call waiting) and LCD. / To perform total function, the communication between main CPU and sub CPU should be needed.

(Inter-processor communication channel)
This connection is used to link the two processor, the 16-bit CPU (Main CPU: IC805, Sub CPU: IC701).



Signal	IC805 Pin No	IC701 Pin No	Function
IPCIN	10	59	Data from Sub CPU (IC701) to Main CPU (IC8
IPCOUT	8	61	Data from Main CPU (IC805) to Sub CPU (IC7
IPCCL	12	63	Clock generated by Main CPU at up to 500 kb
BUSY_PORT	94	74	Ready/Busy from Sub CPU to Main CPU.

Except this data communication between IC805 and IC701, sub CPU (IC701) and main CPU (IC805) are performing the below data communication.

- CPU reference clock: 10 MHz (From IC805 to IC701)

- reset (From IC805 to IC701)

- stop (From IC805 to IC701)

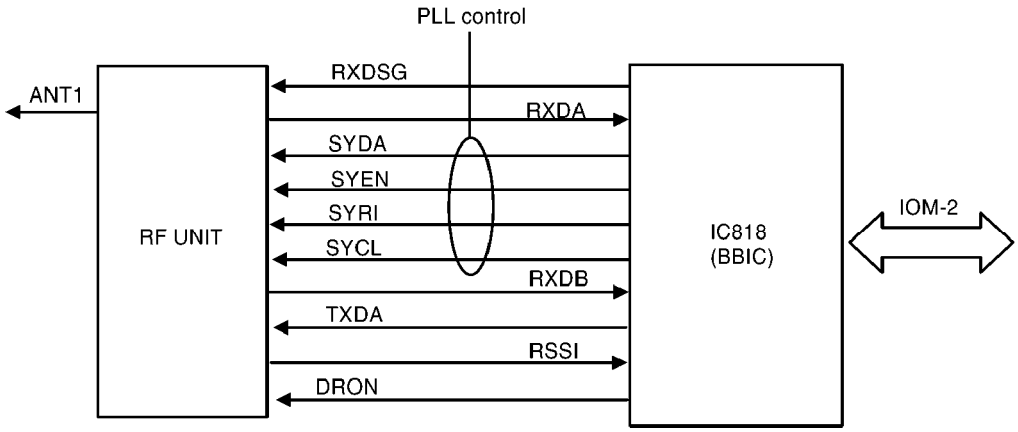
3.4.1. FHSS (Frequency hopping spectrum spread) system consists of BBIC(IC818) and RF UNIT

This system is explained as below.

1. Signal is modulated in Frequency modulation.

2. Carrier signal that is modulated is hopped by BBIC's control.

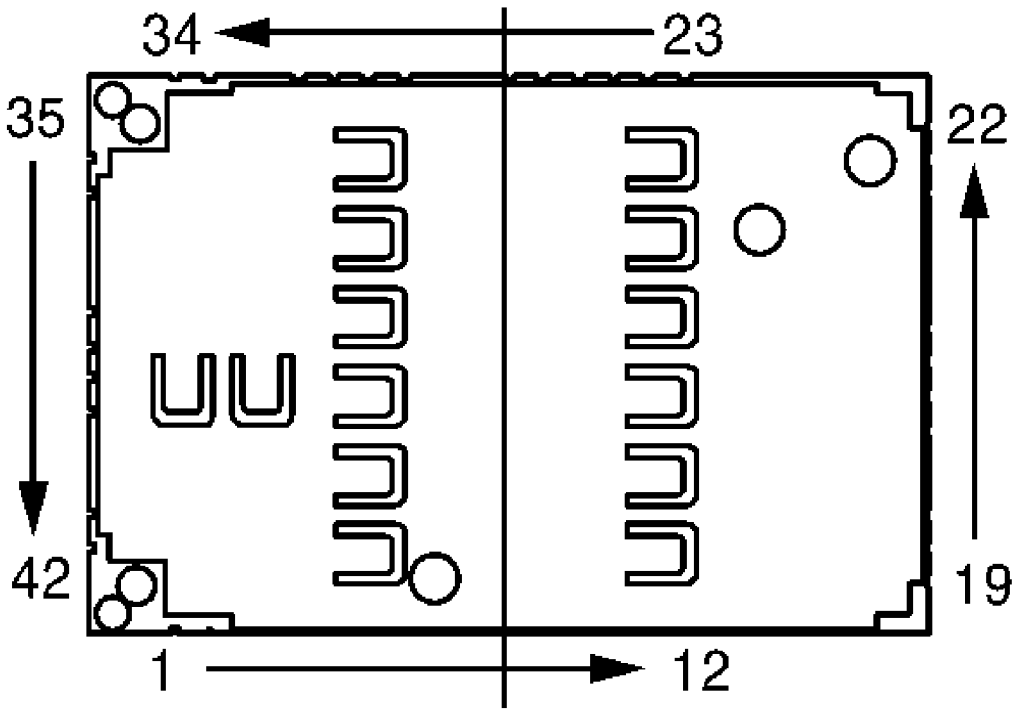
3. Hopping channel is from 0 to 93ch.



3.4.2. RF unit

PQLZ10011Z (For Cordless Handset)
PQWPTG2000KT (For Base Unit)
Pin Description

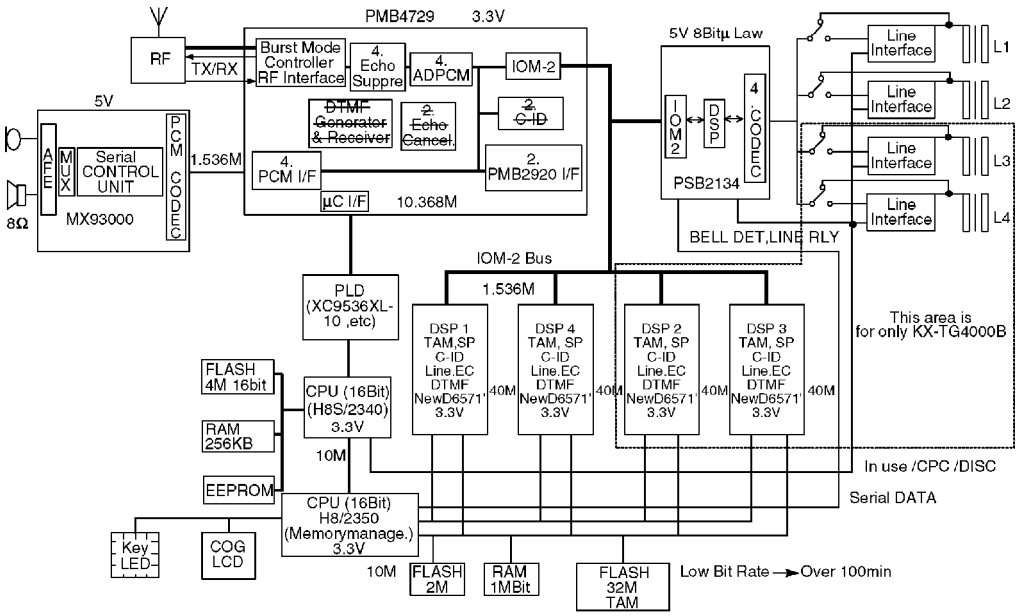
pin no.	Pin name	Input / Output	Description
13	VCC	I	Power Supply BASE UNIT: 3.3 - 4.0V CORDLESS HANDSET: 3.3 - 4.
3	ANT1	I	BASE UNIT: Select Main Antenna, "H" active CORDLESS HANDSET Connection
4	ANT2	I	BASE UNIT: Select Diversity Antenna, "H" active CORDLESS HAND Low Power Mode*
9	RXDSG	I	Receiver Sample & Hold (Data Slice) Gating and Driver Mode Selec
8	RXDA	O	Receiver Data Output (DIGITAL OUT)
7	RXDB	O	RXDA Inverted
16	SYDA	I	PLL Data
17	SYEN	I	PLL Enable
18	SYRI	I	System Reference Frequency Input (10.368 MHz, 100mV rms min.)
19	SYCL	I	PLL Clock
Other pins	GND	-	Pins: 1, 2, 5, 6, 10, 11, 12, 14, 15, 20, 21, 23, 24, 25, 26, 27, 28, 31, 32, 35, 36, 37, 38, 39, 40, 41, 42
22	TXDA	I	TX Data Input Gaussian DATA (BT=0.5)
29	RSSI	O	Radio Signal Strenght Indicator (ANALOG OUT)
30	DRON	I	Power Amplifier On (DIGITAL)



4. BLOCK DIAGRAM

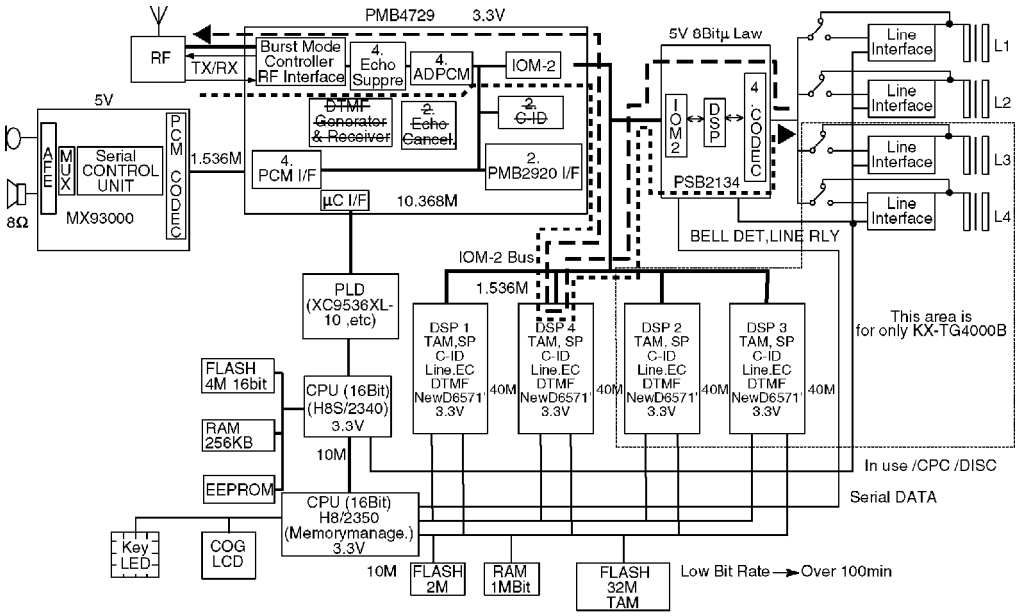
4.1. Block Diagram (Base Unit)

4.2. Function Block Diagram

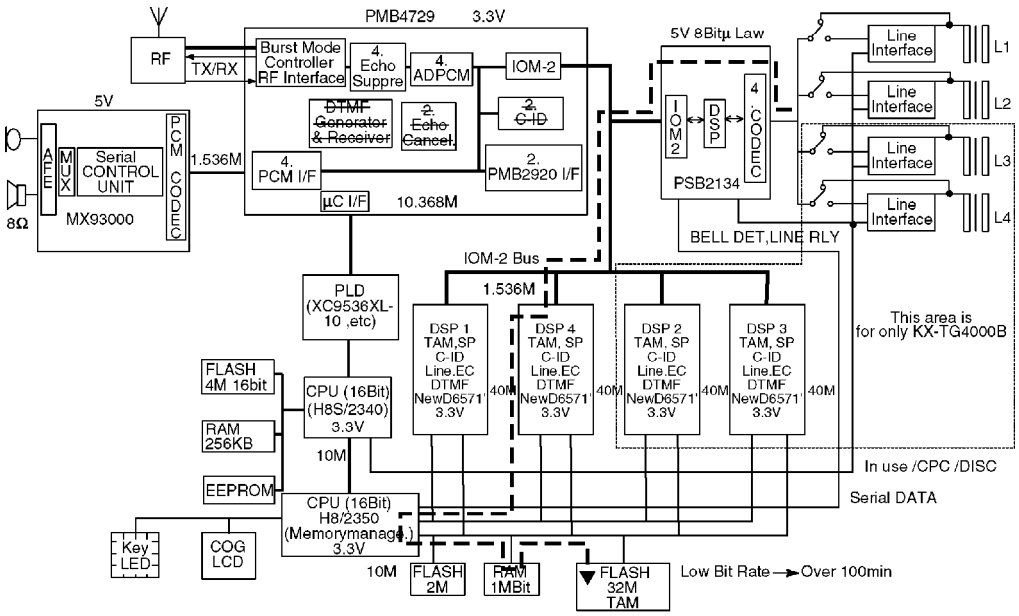


4.3. Signal Flow

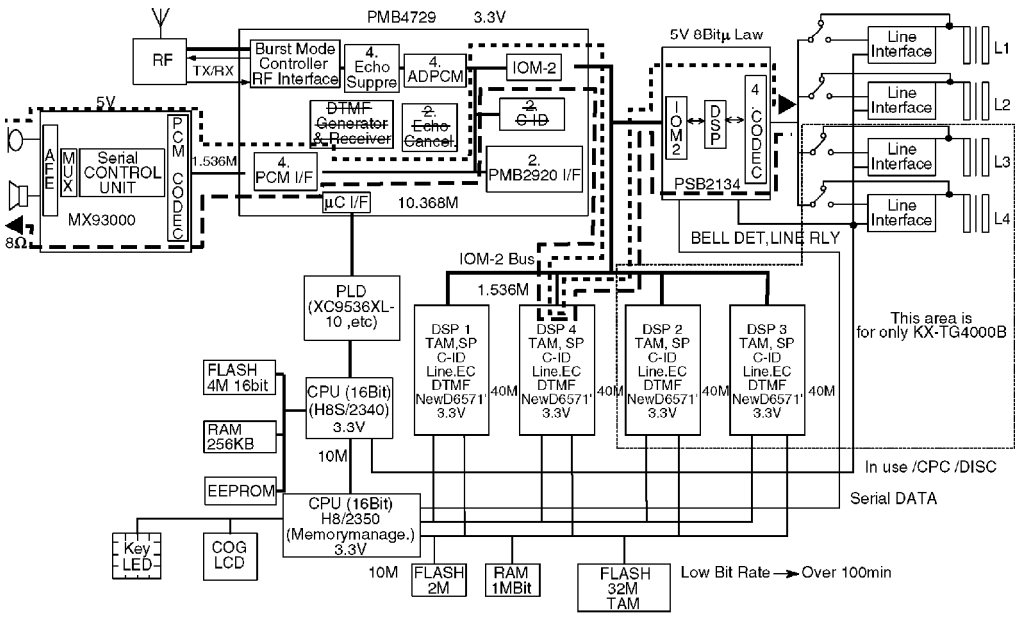
4.3.1. Portable Talk Mode



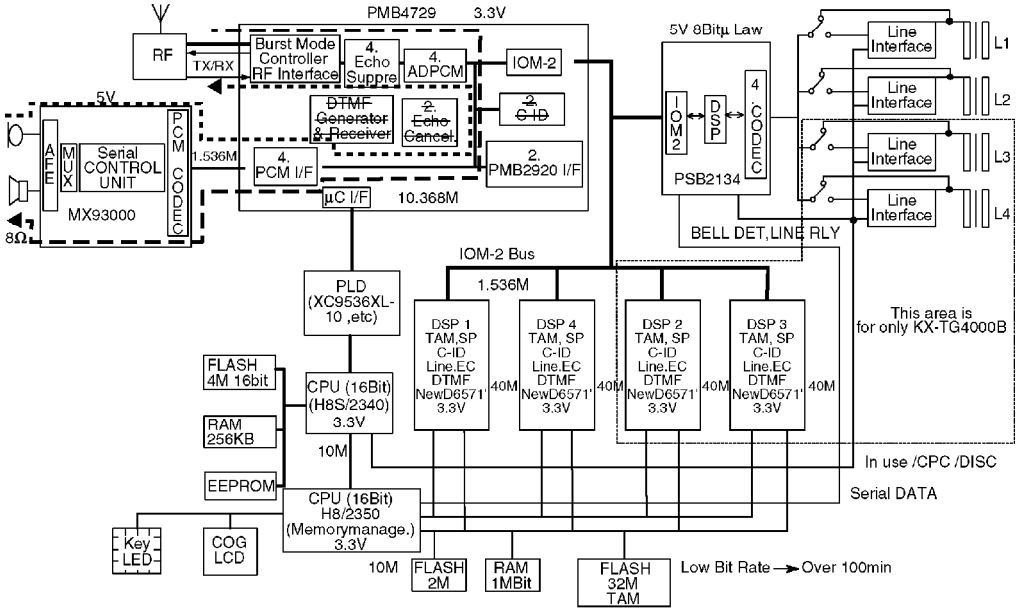
4.3.2. Telephone Answering Mode



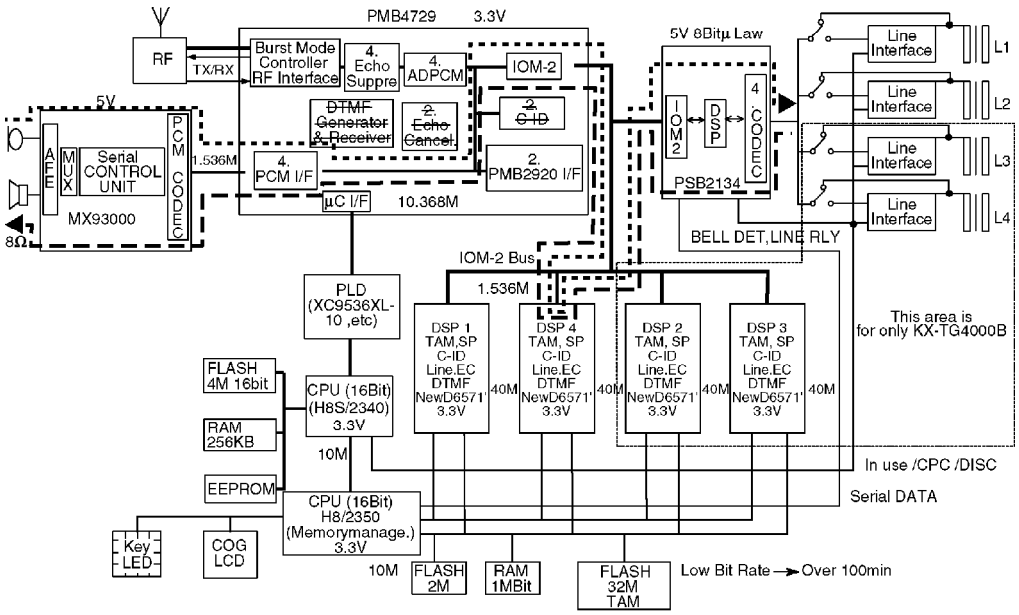
4.3.3. Speakerphone Mode



4.3.4. Intercom Mode

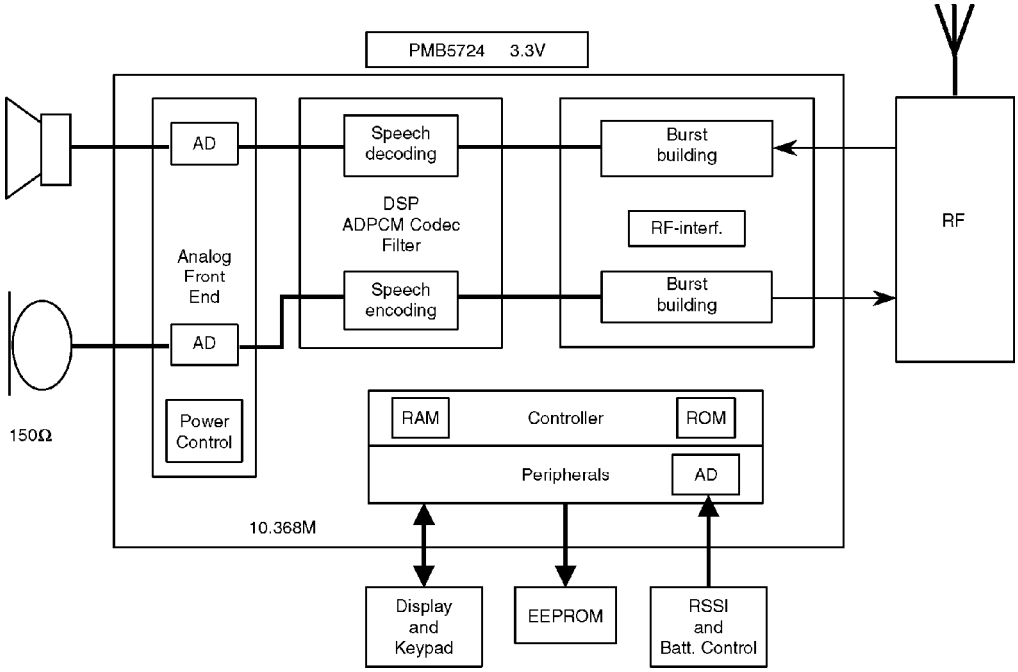


4.3.5. Handset Mode

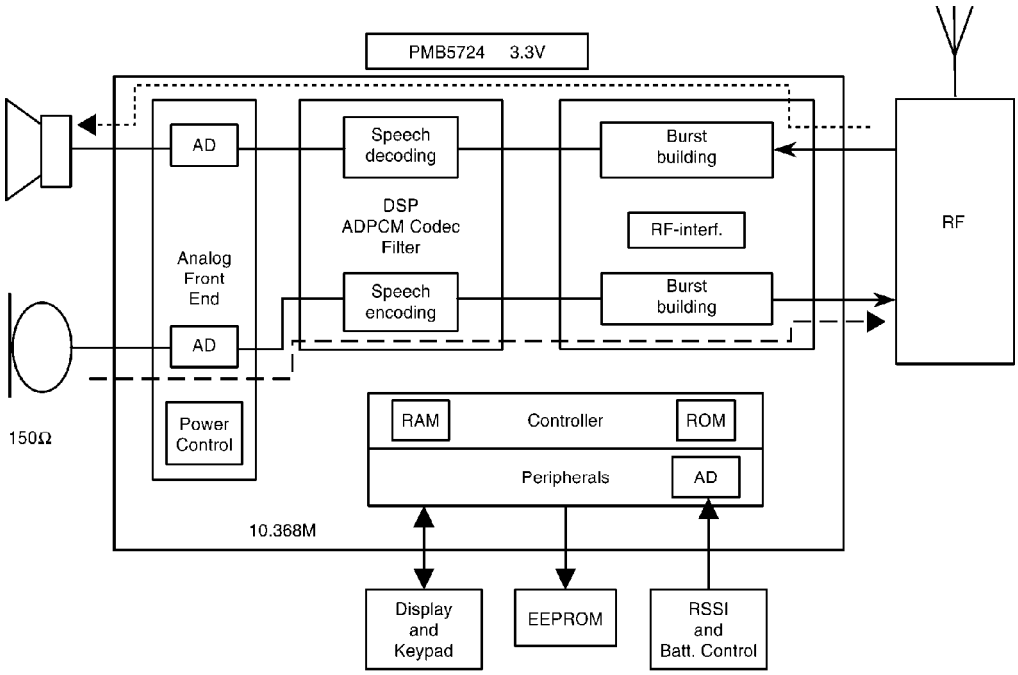


4.4. Block Diagram (Cordless Handset)

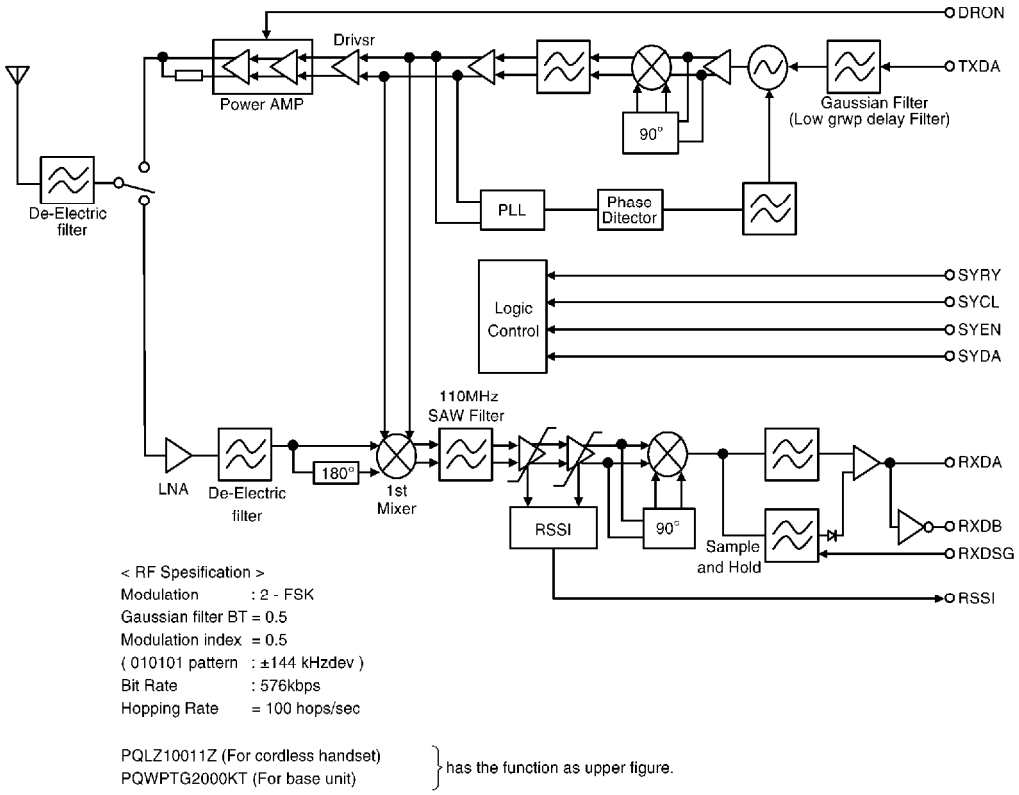
4.5. Function Block Diagram



4.6. Signal Flow



4.7. RF Module Block Diagram

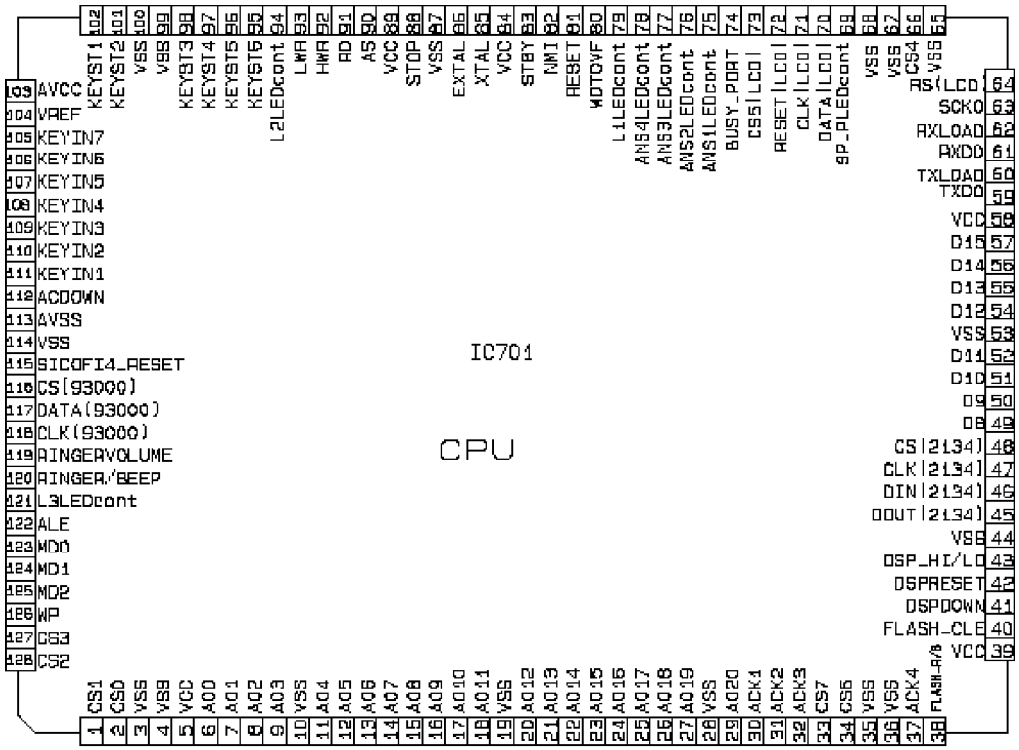


< RF Spesification >
Modulation : 2 - FSK
Gaussian filter BT = 0.5
Modulation index = 0.5
(010101 pattern : ±144 kHzdev)
Bit Rate : 576kbps
Hopping Rate = 100 hops/sec

PQLZ10011Z (For cordless handset)
PQWPTG2000KT (For base unit) } has the function as upper figure.

5. CPU DATA

5.1. Sub CPU Data (Base Unit)

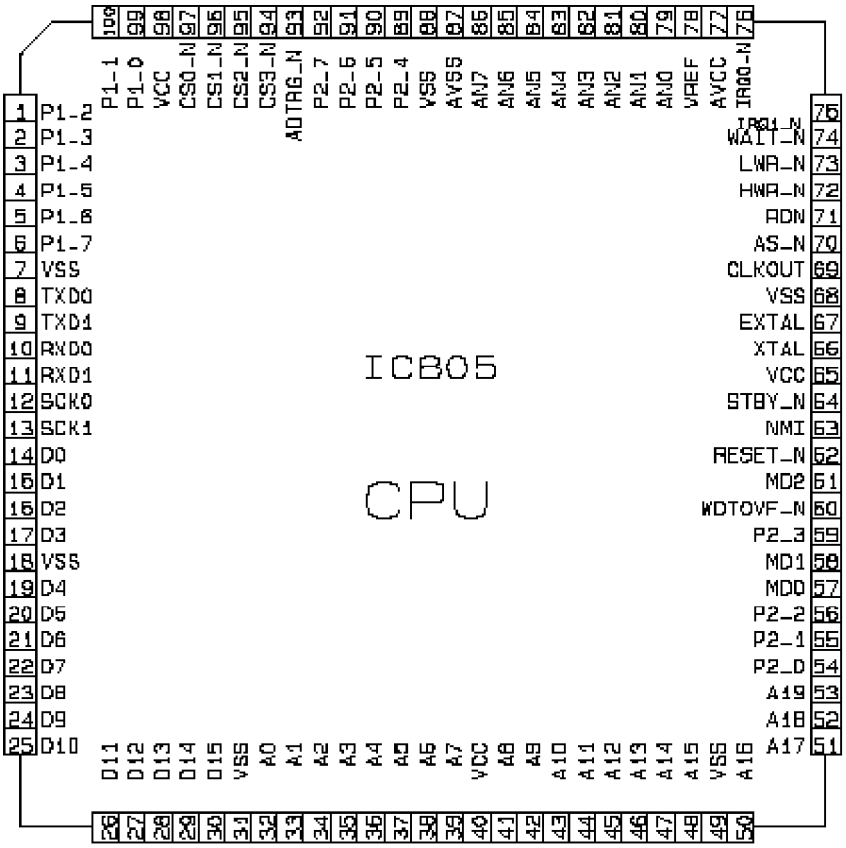


Pin	I/O	Name	High	High-Z	Low
1	O	CS1	NORMAL	-	ACTIE
2	O	CS0	NORMAL	-	ACTIVE
3	I	VSS	-	-	-
4	I	VSS	-	-	-
5	I	VCC	-	-	-
6	O	A00	ADDRESS	-	ADDRESS
7	O	A01	ADDRESS	-	ADDRESS
8	O	A02	ADDRESS	-	ADDRESS
9	O	A03	ADDRESS	-	ADDRESS
10	I	VSS	-	-	-
11	O	A04	ADDRESS	-	ADDRESS
12	O	A05	ADDRESS	-	ADDRESS
13	O	A06	ADDRESS	-	ADDRESS
14	O	A07	ADDRESS	-	ADDRESS
15	O	A08	ADDRESS	-	ADDRESS
16	O	A09	ADDRESS	-	ADDRESS
17	O	A010	ADDRESS	-	ADDRESS
18	O	A011	ADDRESS	-	ADDRESS
19	I	VSS	-	-	-
20	O	A012	ADDRESS	-	ADDRESS
21	O	A013	ADDRESS	-	ADDRESS
22	O	A014	ADDRESS	-	ADDRESS
23	O	A015	ADDRESS	-	ADDRESS
24	O	A016	ADDRESS	-	ADDRESS
25	O	A017	ADDRESS	-	ADDRESS
26	O	A018	ADDRESS	-	ADDRESS
27	O	A019	ADDRESS	-	ADDRESS
28	I	VSS	-	-	-
29	O	A020	ADDRESS	-	ADDRESS
30	I	ACK1	READY	-	BUSY
31	I	ACK2	READY	-	BUSY
32	I	ACK3	READY	-	BUSY
33	O	CS7	NORMAL	-	ACTIE
34	O	CS6	NORMAL	-	ACTIVE
35	I	VSS	-	-	-
36	I	VSS	-	-	-
37	I	ACK4	READY	-	BUSY
38	O	FLASH_R/B	READY	-	BUSY
39	I	VCC	-	-	-
40	O	FLASH_CLE	ACTIVE	-	NORMAL
41	O	DSPDOWN	POWER ON	-	POWER OFF
42	O	DSPRESET	RESET	-	NORMAL
43	O	DSP_HI/LO	Hi-BYTE	-	Low-BYTE
44	I	VSS	-	-	-
45	I	DOUTT (2134)	DATA	-	DATA

Pin	I/O	Name	High	High-Z	Low
46	O	DIN (2134)	DATA	-	DATA
47	O	CLK (2134)	CLOCK	-	CLOCK
48	O	CS (2134)	NORMAL	-	ACTIVE
49	I/O	D8	DATA	-	DATA
50	I/O	D9	DATA	-	DATA
51	I/O	D10	DATA	-	DATA
52	I/O	D11	DATA	-	DATA
53	I	VSS	-	-	-
54	I/O	D12	DATA	-	DATA
55	I/O	D13	DATA	-	DATA
56	I/O	D14	DATA	-	DATA
57	I/O	D15	DATA	-	DATA
58	I	VCC	-	-	-
59	O	TXD0	DATA	-	DATA
60	O	TXLOAD	DATA	-	DATA
61	I	RXD0	DATA	-	DATA
62	I	AXLOAD	DATA	-	DATA
63	I	SCK0	DATA	-	DATA
64	O	RS (LCD)	DATA	-	INSTRACTION
65	I	VSS	-	-	-
66	O	CS4	NORMAL	-	ACTIVE
67	I	VSS	-	-	-
68	I	VSS	-	-	-
69	I/O	SP_PLEDcont	LED ON	LED OFF	-
70	O	DATA (LCD)	DATA	-	DATA
71	O	CLK (LCD)	CLOCK	-	CLOCK
72	O	RESET (LCD)	NORMAL	-	RESET
73	O	CS5 (LCD)	NORMAL	-	ACTIVE
74	O	BUSY_PORT	READY	-	BUSY
75	O	ANS1LEDcont	LED ON	-	LED OFF
76	O	ANS2LEDcont	LED ON	-	LED OFF
77	O	ANS3LEDcont	LED ON	-	LED OFF
78	O	ANS4LEDcont	LED ON	-	LED OFF
79	O	L1LEDcont	LED ON	-	LED OFF
80	O	WDTOVF	-	-	NOT USED
81	I	RESET	NORMAL	-	RESET
82	I	NMI	FIXED	-	-
83	I	STBY	FIXED	-	-
84	I	VCC	-	-	-
85	I	XTAL	CLOCK	-	CLOCK
86	I	EXTAL	-	-	-
87	I	VSS	-	-	-
88	I	STOP	NORMAL	-	STOP
89	I	VCC	-	-	-
90	O	AS	-	-	-

Pin	I/O	Name	High	High-Z	Low
91	O	RD	NORMAL	-	ACTIVE
92	O	HWR	NORMAL	-	ACTIVE
93	O	LWR	-	-	-
94	O	L2LEDcont	LED ON	-	LED OFF
95	O	KEYST6	-	STRB OFF	STRB ON
96	O	KEYST5	-	STRB OFF	STRB ON
97	O	KEYST4	-	STRB OFF	STRB ON
98	O	KEYST3	-	STRB OFF	STRB ON
99	I	VSS	-	-	-
100	I	VSS	-	-	-
101	O	KEYST2	-	STRB OFF	STRB ON
102	O	KEYST1	-	STRB OFF	STRB ON
103	I	AVCC	-	-	-
104	I	VREF	-	-	-
105	I	KEYIN7	OFF	-	ON
106	I	KEYIN6	OFF	-	ON
107	I	KEYIN5	OFF	-	ON
108	I	KEYIN4	OFF	-	ON
109	I	KEYIN3	OFF	-	ON
110	I	KEYIN2	OFF	-	ON
111	I	KEYIN1	OFF	-	ON
112	I	ACDOWN		-	DOWN
113	I	AVSS	-	-	-
114	I	VSS	-	-	-
115	O	SICOFI4_RESET	NORMAL	-	RESET
116	O	CS (93000)	NORMAL	-	ACTIVE
117	O	DATA (93000)	-	-	-
118	O	CLK (93000)	-	-	-
119	O	RINGERVOLUME	-	HIGH	LOW
120	O	RINGER/BEEP	BEEP	-	BEEP
121	O	L3LEDcont	-	-	-
122	O	ALE	ACTIVE	-	NORMAL
123	I	MD0	FIXED	-	-
124	I	MD1	-	-	FIXED
125	I	MD2	FIXED	-	-
126	O	WP	NORMAL	-	ACTIVE
127	O	CS3	NORMAL	-	ACTIVE
128	O	CS2	NORMAL	-	ACTIVE

5.2. Main CPU Data (Base Unit)



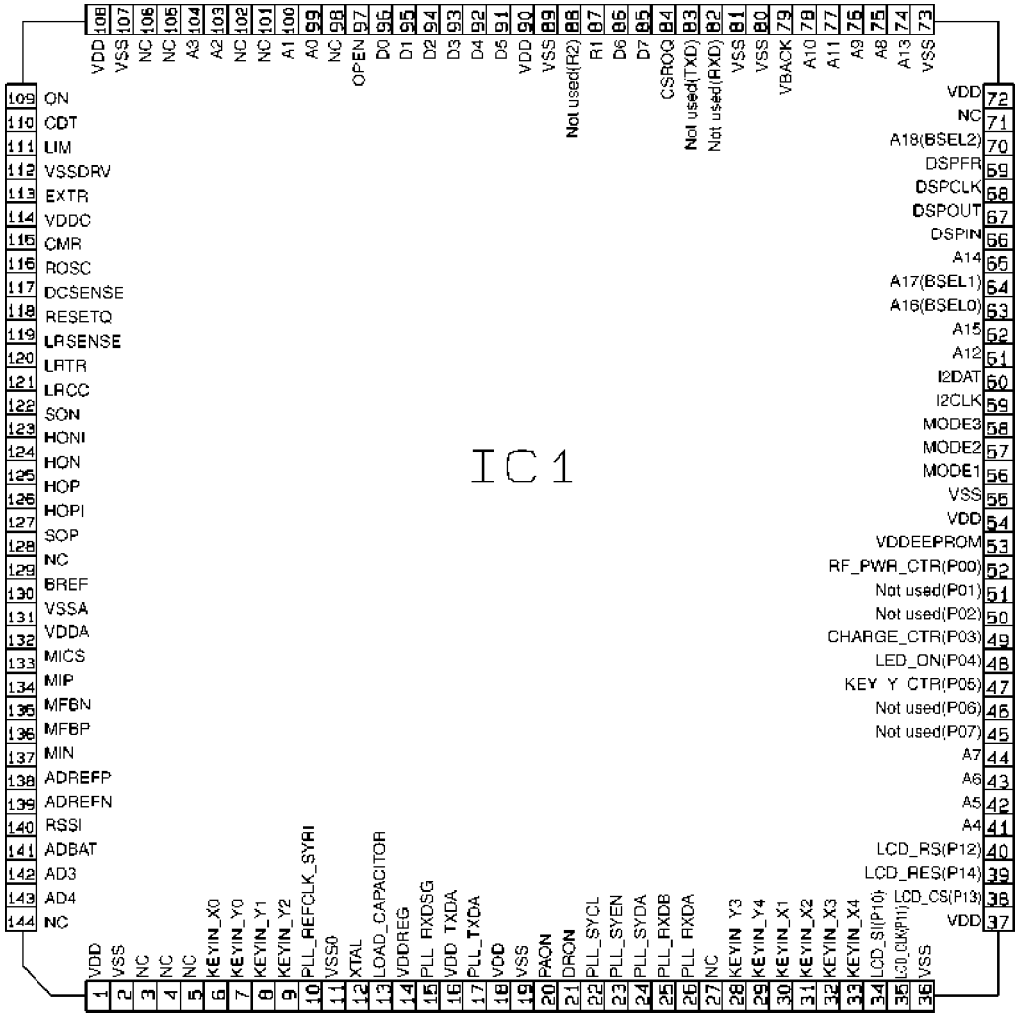
Pin	I/O	Name	High	High-Z	Low
1	I	P1_2	-	-	-
2	I	P1_3	-	-	-
3	O	P1_4			
4		P1_5			
5	O	P1_6	LED ON	-	LED OFF
6	O	P1_7	-		
7	I	VSS	-	-	-
8	O	TXD0	DATA	-	DATA
9	O	TXD1	DATA	-	DATA
10	I	RXD0	DATA	-	DATA
11	I	RXD1	DATA	-	DATA
12	O	SCK0	DATA	-	DATA
13	O	SCK1	-		
14	O	D0	DATA	-	DATA
15	O	D1	DATA	-	DATA
16	O	D2	DATA	-	DATA
17	O	D3	DATA	-	DATA
18	I	VSS	-	-	-
19	O	D4	DATA	-	DATA
20	O	D5	DATA	-	DATA
21	O	D6	DATA	-	DATA
22	O	D7	DATA	-	DATA

Pin	I/O	Name	High	High-Z	Low
23	O	D8	DATA	-	DATA
24	O	D9	DATA	-	DATA
25	O	D10	DATA	-	DATA
26	O	D11	DATA	-	DATA
27	O	D12	DATA	-	DATA
28	O	D13	DATA	-	DATA
29	O	D14	DATA	-	DATA
30	O	D15	DATA	-	DATA
31	I	VSS	-	-	-
32	O	A0	ADDRESS	-	ADDRESS
33	O	A1	ADDRESS	-	ADDRESS
34	O	A2	ADDRESS	-	ADDRESS
35	O	A3	ADDRESS	-	ADDRESS
36	O	A4	ADDRESS	-	ADDRESS
37	O	A5	ADDRESS	-	ADDRESS
38	O	A6	ADDRESS	-	ADDRESS
39	O	A7	ADDRESS	-	ADDRESS
40	I	VCC	-	-	-
41	O	A8	ADDRESS	-	ADDRESS
42	O	A9	ADDRESS	-	ADDRESS
43	O	A10	ADDRESS	-	ADDRESS
44	O	A11	ADDRESS	-	ADDRESS
45	O	A12	ADDRESS	-	ADDRESS
46	O	A13	ADDRESS	-	ADDRESS
47	O	A14	ADDRESS	-	ADDRESS
48	O	A15	ADDRESS	-	ADDRESS
49	I	VSS	-	-	-
50	O	A16	ADDRESS	-	ADDRESS
51	O	A17	ADDRESS	-	ADDRESS
52	O	A18	ADDRESS	-	ADDRESS
53	O	A19	ADDRESS	-	ADDRESS
54	O	P2_0	NORMAL	-	RESET
55	O	P2_1	BATTERY	-	AC
56	I	P2_2	AC	-	AC DOWN
57	I	MD0	-	-	FIXED
58	I	MD1	-	-	FIXED
59	I	P2_3	NORMAL	-	POWER FAIL
60	O	WDTOVF_N	-	-	-
61	I	MD2	FIXED	-	-
62	I	RESET_N	NORMAL	-	RESET
63	I	NMI	FIXED	-	-
64	I	STBY_N	FIXED	-	-
65	I	VCC	-	-	-
66	I	XTAL	-	-	-
67	I	EXTAL	-	-	-

Pin	I/O	Name	High	High-Z	Low
68	I	VSS			
69	O	CLKOUT	CLOCK OUT		CLOCK OUT
70	O	AS_N	NORMAL		ACTIVE
71	O	RDN	NORMAL		READ
72	O	HWR_N	NORMAL		ACCESS
73	O	LWR_N	NORMAL		ACCESS
74	I	WAIT_N	FIXED	-	-
75	I	IRQ1_N	FIXED	-	-
76	I	IRQ0_N	FIXED	-	-
77	I	AVCC	-	-	-
78	I	VREF	-	-	-
79	AI	AN0	ADDATA	-	ADDATA
80	AI	AN1	ADDATA	-	ADDATA
81	AI	AN2	ADDATA	-	ADDATA
82	AI	AN3	ADDATA	-	ADDATA
83	AI	AN4	ADDATA	-	ADDATA
84	AI	AN5	ADDATA	-	ADDATA
85		AN6	-	-	-
86	AO	AN7	DADATA	-	DADATA
87	I	AVSS	-	-	-
88	I	VSS	-	-	-
89	O	P2_4	CHARGE		NONCHARGE
90	O	P2_5			
91	O	P2_6			
92	I	P2_7			
93	I	ADTAG_N			
94		CS3_N			
95	O	CS2_N	NORMAL		ACCESS
96	O	CS1_N	NORMAL		ACCESS
97	O	CS0_N	NORMAL	-	ACCESS
98	I	VCC	-	-	-
99	I	P1_0	FIXED	-	-
100	I	P1_1	FIXED	-	-

5.3. CPU Data (Cordless Handset)

IC1 has the function of CPU, base band control, voltage regulator (shunt regulator, DC/DC convertor), A/D input analog circuit and DSP.



PIN	DESCRIPTION	I/O	High	Hi-Z	LOW
1	VDD	D.S	Fixed	-	-
2	VSS	D.G	-	-	Fixed
3	NC	O			
4	NC	O			
5	NC	O			
6	KEYIN_X0	D.I	Normal	-	Active
7	KEYIN_Y0	D.I	Active	-	Normal
8	KEYIN_Y1	D.I	Active	-	Normal
9	KEYIN_Y2	D.I	Active	-	Normal
10	PLL_REFCLK_SYRI	D.O	Active	-	Active
11	VSS0	A.G	-	-	Fixed
12	XTAL	A.O	Oscillation	-	Oscillation
13	LOAD_CAPACITOR	A	-	-	-
14	VDDREG	A.O	Oscillation	-	Oscillation
15	PLL_RXDSG	D.O	Active	-	Normal
16	VDD_TXDA	D.S	Fixed	-	-
17	PLL_TXDA	D.O	Active	Normal	Active
18	VDD	D.S	Fixed	-	-

19	VSS	D.G	-	-	Fixed
20	PAON	D.O	Active	-	Normal
21	DRON	D.O	Active	-	Normal
22	PLL_SYCL	D.O	Active	-	Active
23	PLL_SYEN	D.O	Active	-	Normal
24	PLL_SYDA	D.O	Active	-	Active
25	PLL_RXDB	D.I	Active	-	Active
26	PLL_RXDA	D.I	Active	-	Active
27	NC	O			
28	KEYIN_Y3	D.I	Active	-	Normal
29	KEYIN_Y4	D.I	Active	-	Normal
30	KEYIN_X1	D.I	Normal	-	Active
31	KEYIN_X2	D.I	Normal	-	Active
32	KEYIN_X3	D.I	Normal	-	Active
33	KEYIN_X4	D.I	Normal	-	Active
34	LCD_SI(P10)	D.O	Active	-	Active
35	LCD_CLK(P11)	D.O	Active	-	Active
36	VSS	D.G	-	-	Fixed
37	VDD	D.S	Fixed	-	-
38	LCD_CS(P13)	D.O	Normal	-	Active
39	LCD_RES(P14)	D.O	Normal	-	Active
40	LCD_RS(P12)	D.O	Active	-	Active
41	A4	D.O	Active	Normal	Active
42	A5	D.O	Active	Normal	Active
43	A6	D.O	Active	Normal	Active
44	A7	D.O	Active	Normal	Active
45	Not used(P07)	D.O			Normal
46	Not used(P06)	D.O			Normal
47	KEY_Y_CTR(P05)	D.O	Active	-	Normal
48	LED_ON(P04)	D.O	LED On	-	LED Off
49	CHARGE_CTR(P03)	D.O	Normal		Trickle
50	Not used(P02)	D.O			Normal
51	Not used(P01)	D.O			Normal
52	RF_PWR_CTR(P00)	D.O	Normal		
53	VDDEEPROM	D.S	Active	-	-
54	VDD	D.S	Fixed	-	-
55	VSS	D.G	-	-	Fixed
56	MODE1	D.I			Fixed
57	MODE2	D.I			Fixed
58	MODE3	D.I			Fixed
59	I2CLK	D.O	Active	-	Active
60	I2DAT	D.O	Active	-	Active
61	A12	D.O	Active	Normal	Active
62	A15	D.O	Active	Normal	Active
63	A16(BSEL0)	D.O	Active	Normal	Active
64	A17(BSEL1)	D.O	Active	Normal	Active

65	A14	D.O	Active	Normal	Active
66	DSPIN	D.I			Fixed
67	DSPOUT	D.O			Fixed
68	DSPCLK	D.O			Fixed
69	DSPFR	D.O			Fixed
70	A18(BSEL2)	D.O	Active	Normal	Active
71	NC	O			
72	VDD	D.S	Fixed	-	-
73	VSS	D.G	-	-	Fixed
74	A13	D.O	Active	Normal	Active
75	A8	D.O	Active	Normal	Active
76	A9	D.O	Active	Normal	Active
77	A11	D.O	Active	Normal	Active
78	A10	D.O	Active	Normal	Active
79	VBACK	D.O			
80	VSS	D.G	-	-	Fixed
81	VSS	D.G	-	-	Fixed
82	Not used(RXD)	D.I			
83	Not used(TXD)	D.O			
84	CSROQ	D.O	Normal	-	Active
85	D7	D.I/ D.O	Active	Normal	Active
86	D6	D.I/ D.O	Active	Normal	Active
87	R1	D.O	Active	-	Active
88	Not used(R2)	D.O			
89	VSS	D.G	-	-	Fixed
90	VDD	D.S	Fixed	-	-
91	D5	D.I/ D.O	Active		Active
92	D4	D.I/ D.O	Active		Active
93	D3	D.I/ D.O	Active	-	Active
94	D2	D.I/ D.O	Active	-	Active
95	D1	D.I/ D.O	Active		Active
96	D0	D.I/ D.O	Active		Active
97	OPEN	I			
98	NC	O			
99	A0	D.O	Active	Normal	Active
100	A1	D.O	Active	Normal	Active
101	NC	O			
102	NC	O			
103	A2	D.O	Active	Normal	Active

104	A3	D.O	Active	Normal	Active
105	NC	O			
106	NC	O			
107	VSS	D.G	-	-	Fixed
108	VDD	D.S	Fixed	-	-
109	VDDB	A.I	Fixed	-	-
110	ON	D.I			
111	CDT	D.I	Charge	-	No charge
112	LIM	D.I	-	-	-
113	VSSDRV	A.G	-	-	Fixed
114	EXTR	D.O	Active	-	Active
115	VDDC	A.S	Fixed	-	-
116	CMR	A.I	Current Mode resistor sense pin		
117	ROSC	A.O	DC-DC Converter signals		
118	DCSENSE	A.I	Reference input for DC-DC converter		
119	RESETQ	D.I	Normal	-	Active
120	LRSENSE	A.I	Reference input for linear regulator		
121	LRTR	A.I	Control pin for voltage regulator		
122	LRCC	A.I	AC input for voltage regulator		
123	SON	A.O	D/A converter output		
124	HONI	A.I	Sp Amp. Input pin		
125	HON	A.O	Sp Amp. Input pin		
126	HOP	A.O	Sp Amp. output pin		
127	HOPI	A.I	Sp Amp. output pin		
128	SOP	A.O	D/A converter output		
129	NC	NC	-	-	-
130	BREF	A.S	Fixed	-	-
131	VSSA	A.G	-	-	Fixed
132	VDDA	A.S	Fixed	-	-
133	MICS	A.G	Fixed		-
134	MIP	A.I	Mic Amp. Input pin		
135	MFBN	A.O	Mic Amp. output pin		
136	MFBP	A.O	Mic Amp. output pin		
137	MIN	A.I	Mic Amp. Input pin		
138	ADREFP	A.O	Fixed		-
139	ADREFN	A.O	Fixed		-
140	RSSI	A.I	Active	-	Active
141	ADBAT	A.I	Active	-	Active
142	AD3	A.I			
143	AD4	A.I	Headset	-	No headset
144	NC	D.S			

6. SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARD

6.1. SCHEMATIC DIAGRAM (Base Unit (1/2))

6.2. SCHEMATIC DIAGRAM (Base Unit (2/2))

6.3. SCHEMATIC DIAGRAM (Cordless Handset)

6.4. PRINTED CIRCUIT BOARD (Base unit (Flow Solder Side View))

6.5. PRINTED CIRCUIT BOARD (Base Unit (Component View))

6.6. PRINTED CIRCUIT BOARD (Cordless Handset (Flow Solder Side View))

6.7. PRINTED CIRCUIT BOARD (Cordless Handset (Component View))

6.8. IC Port

6.9. PRINTED CIRCUIT BOARD (Base unit (Operation))

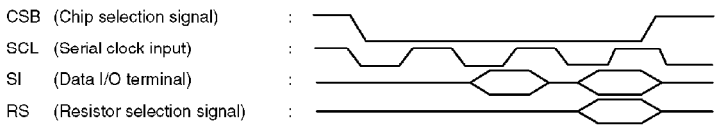
6.10. SCHEMATIC DIAGRAM (Charger)

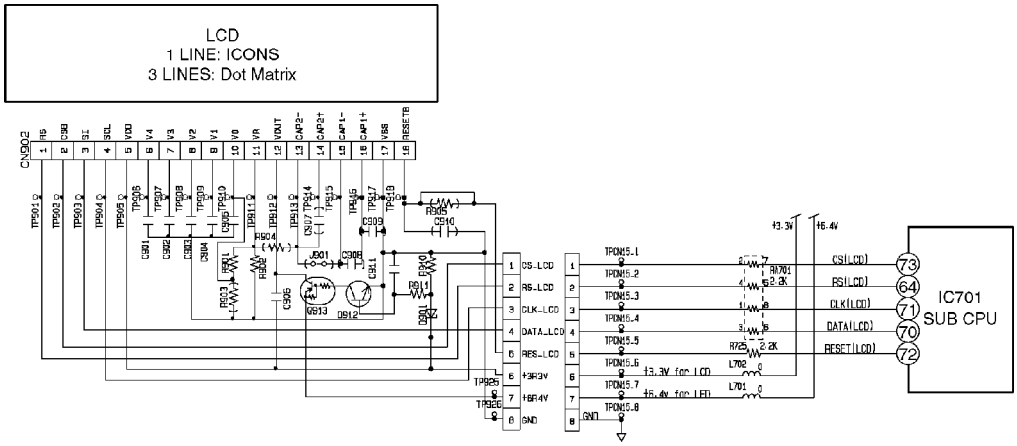
6.11. PRINTED CIRCUIT BOARD (Charger)

7. CIRCUIT OPERATION (BASE UNIT)

7.1. LCD Circuit

This LCD incorporating a COG IC uses one line for icon display and three lines for character display.
The COG LCD is controlled by 4 control lines (CSB, SCL, SI and RS) from IC701.
Two systems are used for power supply, a 3.3 V system and a 6.4 V system. The 3.3 V system supplies power for the display and the 6.4 V system supplies power for LCD contrast.The LCD boots up using the 3.3 V system, so Q912 and Q913 are used to control the 6.4 V system so that it is activated later.
The LCD contrast is set by the voltage at pin 11, so the output voltage from pin 10 is divided at R902 and R901.



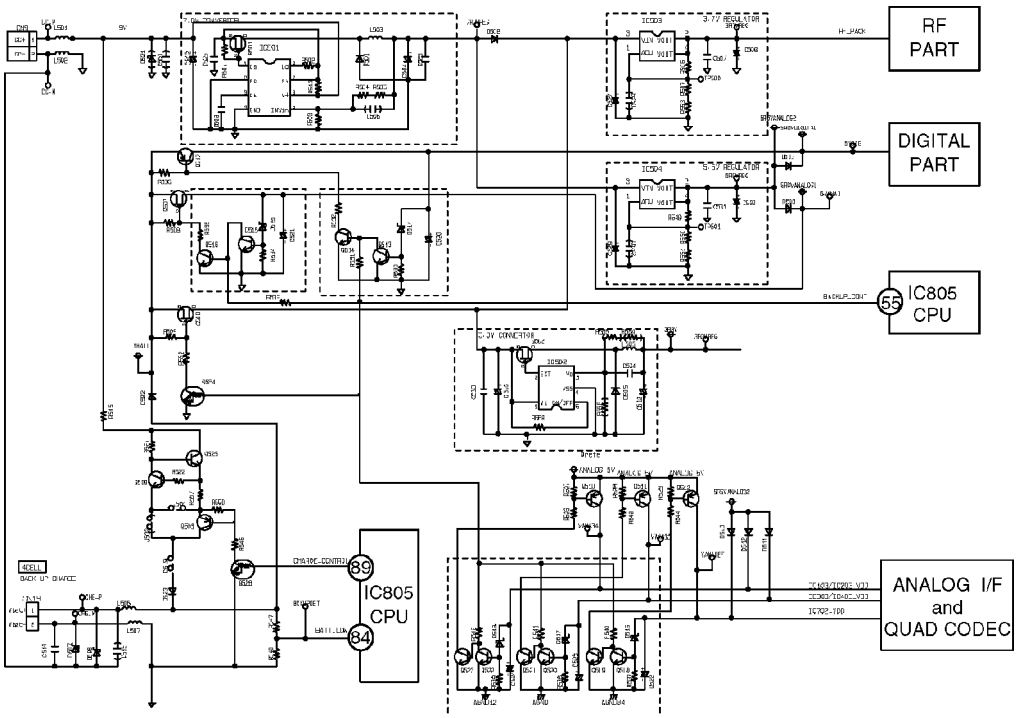


7.2. Battery Power Supply

The circuit shown below is the circuit which switches the power supply form AC adaptor to power supply from the battery (when the battery is connected) if power supply from the AC adaptor is cut.

Whether or not the battery is connected is conveyed to pin 84 of IC805 by the voltage division of R547 and R548. At this time, if the power from the AC adaptor is interrupted and the AC DOWN signal is input, pin 55 of IC805 outputs a HIGH signal which turns on Q514, Q516, Q524, Q519, Q521 and Q523, so Q517, Q507, Q508, Q512, Q511 and Q510 connected to these are turned on and power is supplied to each circuit.

However, this circuit operates only after power from the AC adaptor is cut; it does not operate if power is supplied from the battery from the beginning.

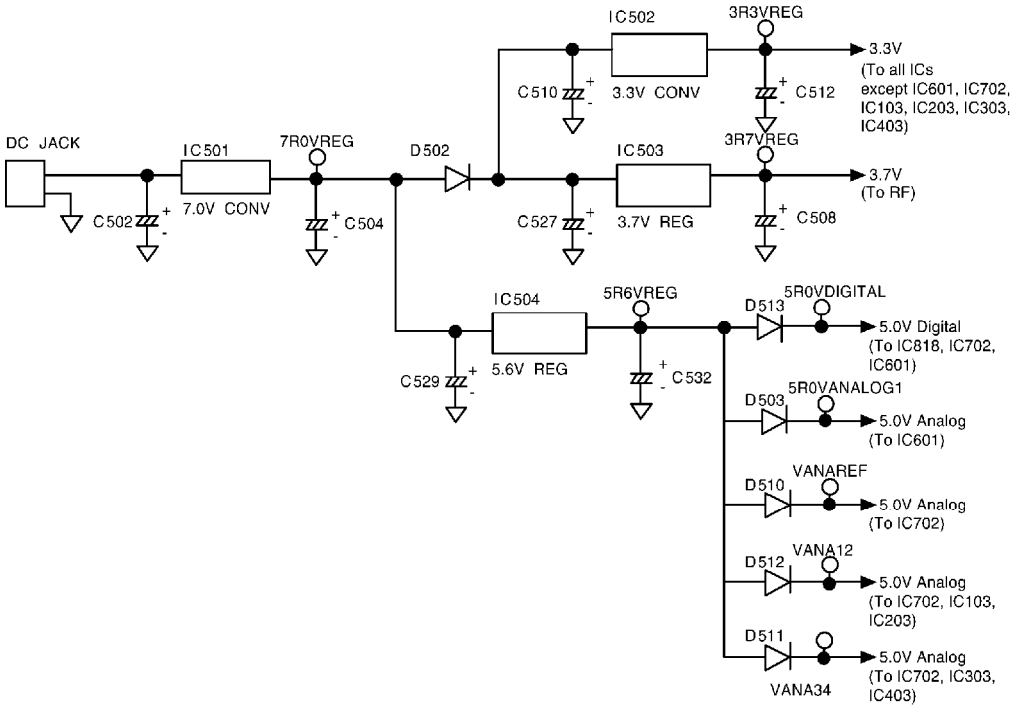


7.3. Power Supply Circuit

As indicated in the illustration, the various voltages are supplied constantly to their respective blocks.

IC501 and IC502: step down DC-DC Converter

IC503 and IC504: Low-dropout Linear Regulator



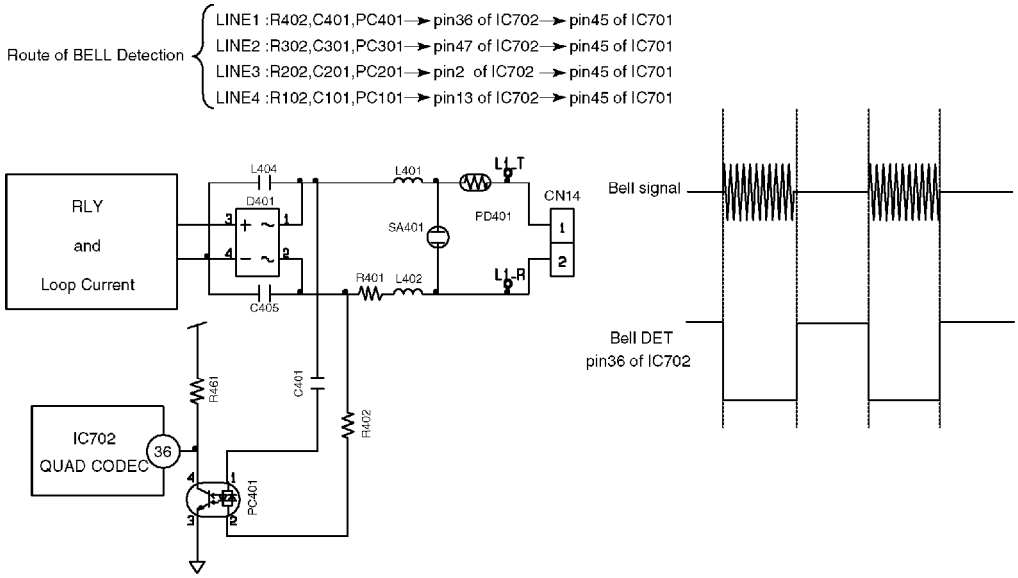
7.4. Bell Detection Circuit (In case of Line1)

When the Bell signal is input between T/R, its waveform is shaped through C401 to PC401, then fed to pin 36 of CODEC IC702.

When the CODEC detects the Bell signal, it sends a signal from pin45 of Sub CPU IC701.

To obtain a display synchronized with the bell signal, an L1LED cont signal is output from pin79 of IC701 and then L1LED is flashed.

Cordless handset receive a bell signal from the base unit through RF (The data path: CPU IC805, PLD IC801, Baseband IC818 to RF UNIT) and then cordless handset ringers are on. When the cordless handset is switched from the STANDBY to TALK, the base unit stop the bell sound and catch the line.

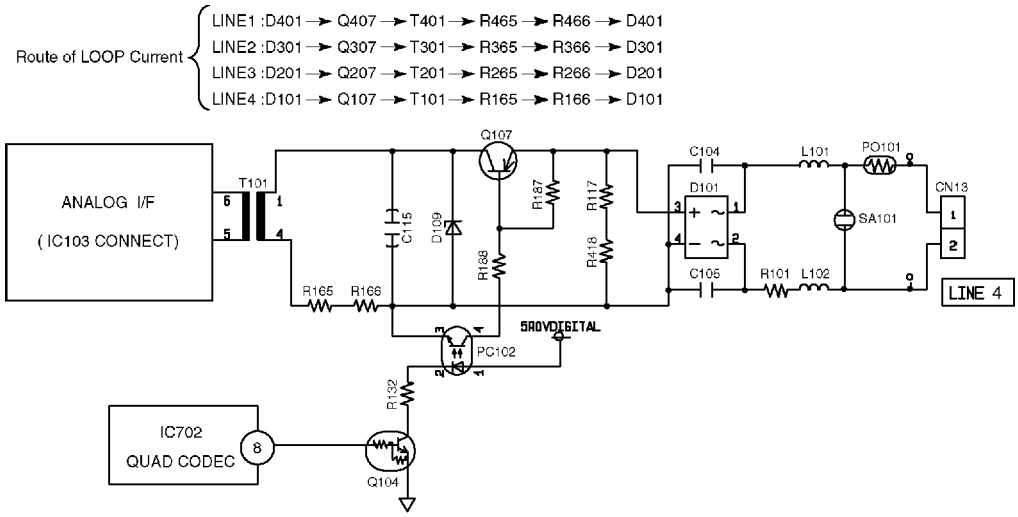


Caution

Sampling is performed every 2 ms and it is determined that a Bell signal exists if "Low" is detected for 57% or above out of 44 samples.

7.5. Line Interface

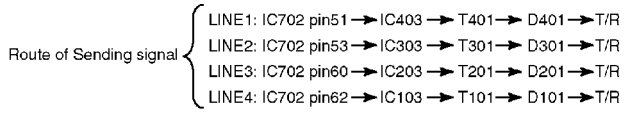
When off-hook (In talk or TAM status), as for Line4, pin 8 of IC702 change to high level, causing Q107 and PC102 turn on and line loop current flows. A telephone line is seized in result. The loop current flows from D101, Q107, T101, R165 and R166. When dialing, pin8 of IC702 outputs a pulse signal so that it switches the line loop on and off to generate the dial pulse signal.

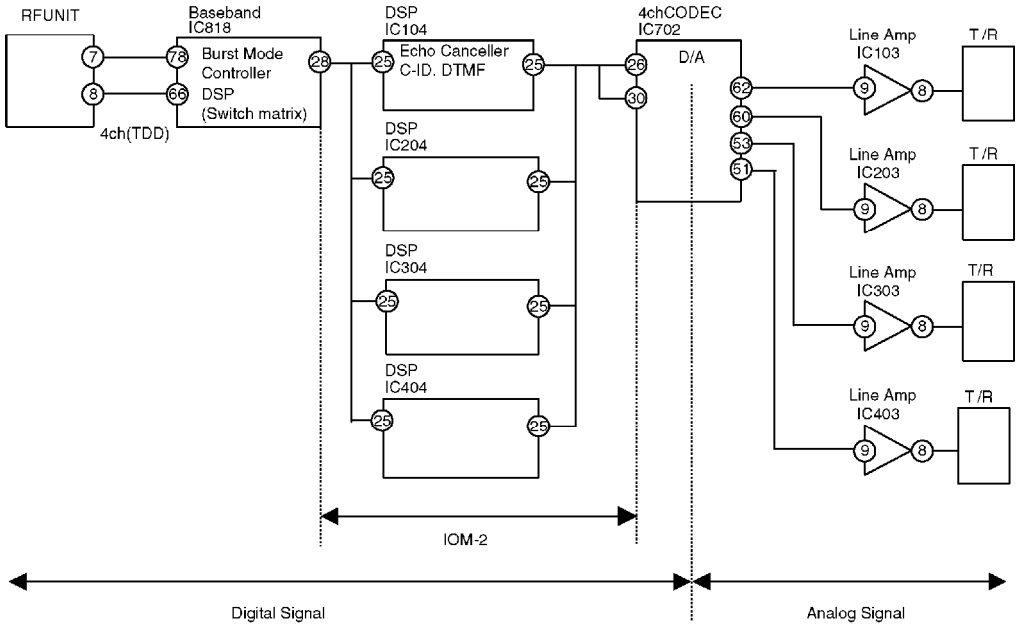


7.6. Line Sending Signal (Portable talk mode)

The audio signal and control data for 4 lines are sent by Time Division Duplex (for IOM-2 interface), sharing the same signal path. This enables to use the 4 line at the same time. /
The digital RX data and inverted data from pin7 and pin8 of RF Unit are input to pin78 and pin 66 of IC818. IC818 converts the data to 8-bit u-law-encoded and send to pin25 of select DSP IC104 and IC404 by the use line number. DSP IC104 and IC404 executes echo cancellation and DTMF generation for Line1 - Line4 each. Then the data is sent to pin26 and pin 30 of IC702. /

Then the data is sent to pin26 and pin30 of IC702. IC702 converts the data into analog audio signal. Then the audio signal is sent to the LINE.

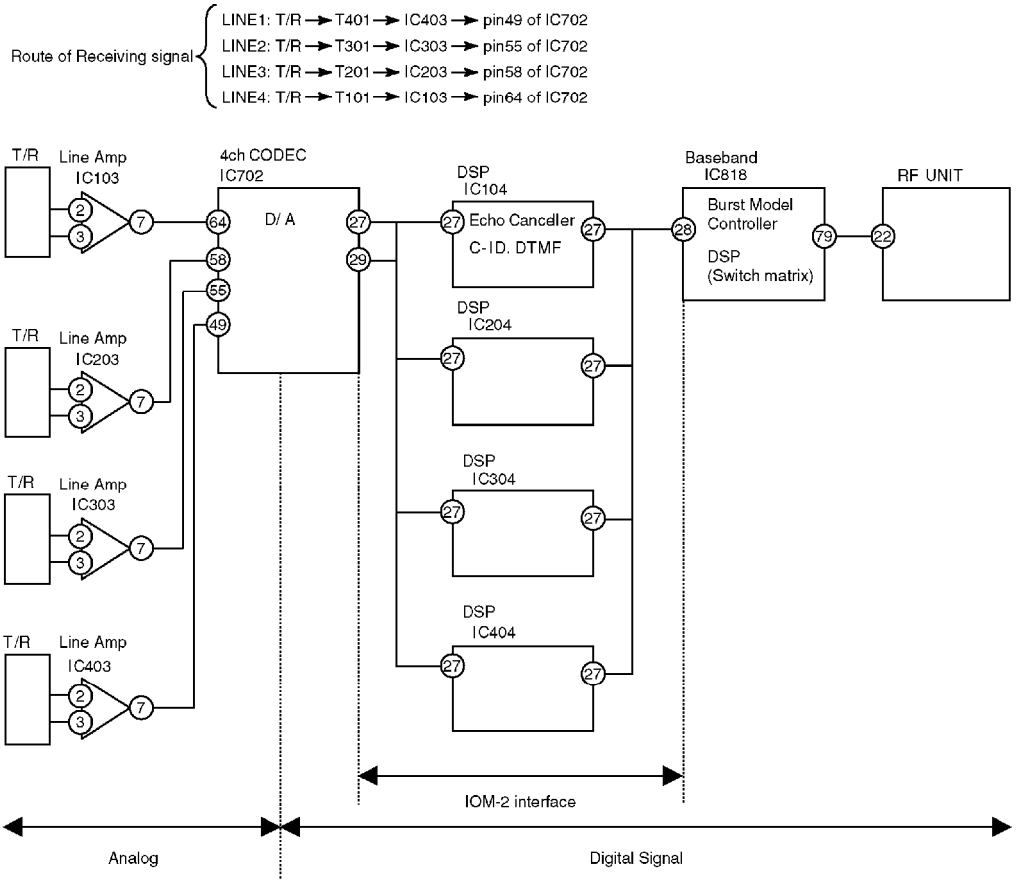

Route of Sending signal
LINE1: IC702 pin51 → IC403 → T401 → D401 → T/R
LINE2: IC702 pin53 → IC303 → T301 → D301 → T/R
LINE3: IC702 pin60 → IC203 → T201 → D201 → T/R
LINE4: IC702 pin62 → IC103 → T101 → D101 → T/R



7.7. Line Receiving Signal

Portable talk mode

The audio signal and control data for 4 lines are sent by Time Division Duplex (for IOM-2 interface), sharing the same signal path. This enables to use the 4 line at the same time. /
The audio signal from line transformer T301 - T401 is input to IC301 - IC403. IC301 - IC403 comprise line amplifier. These signals are output to pin64, 58, 55, 49 of IC702, according to Line4 - Line1. IC702 converts the signals into 8bit u-law data and sends to pin27 of IC104 and IC404. DSP IC104 and IC404 execute echo cancellation and DTMF reception for one channel each, and send the data to IC818. IC818 converts the data into digital TX data, then sends to pin22 of RF Unit.



7.8. Side Tone Circuit

The circuit diagram below shows the LINE interface of each LINE with the telephone line, and the interface circuit between the 4-channel CODEC of IC702.
This circuit is comprised of the level control for transmission and reception, and the side tone circuit.

Transmission Route:

LINE1: pin62 of IC702 → C434 → R458 → pin9 of IC403 → pin8 of IC403 → R435 → T401
pin13 of IC403 → pin14 of IC403 → R438 → T401

LINE2: pin62 of IC702 → C334 → R358 → pin9 of IC303 → pin8 of IC303 → R335 → T301
pin13 of IC303 → pin14 of IC303 → R338 → T301

LINE3: pin62 of IC702 → C234 → R258 → pin9 of IC203 → pin8 of IC203 → R235 → T201
pin13 of IC203 → pin14 of IC203 → R238 → T201

LINE4: pin62 of IC702 → C134 → R158 → pin9 of IC103 → pin8 of IC103 → R135 → T101
pin13 of IC103 → pin14 of IC103 → R138 → T101

Reception Route:

LINE1 : T401→C438→R445→pin2 of IC403→pin1 of IC403→R449→R450→pin6 of IC403→pin7 of IC403→R459→C435→pin64 of IC702
LINE2 : T301→C338→R345→pin2 of IC303→pin1 of IC303→R349→R350→pin6 of IC303→pin7 of IC303→R359→C335→pin55 of IC702
LINE3 : T201→C238→R245→pin2 of IC203→pin1 of IC203→R249→R250→pin6 of IC203→pin7 of IC203→R259→C235→pin58 of IC702
LINE4 : T101→C138→R145→pin2 of IC103→pin1 of IC103→R149→R150→pin6 of IC103→pin7 of IC103→R159→C135→pin64 of IC702

The side tone cancellation circuit operates so that output of pin 14 of IC103 is input to pin 3 of IC103 via C169, R137, C139 and R169 to cancel the signal returned from the line that is input to pin 2 of IC103

Route of side tone cancellation circuit:

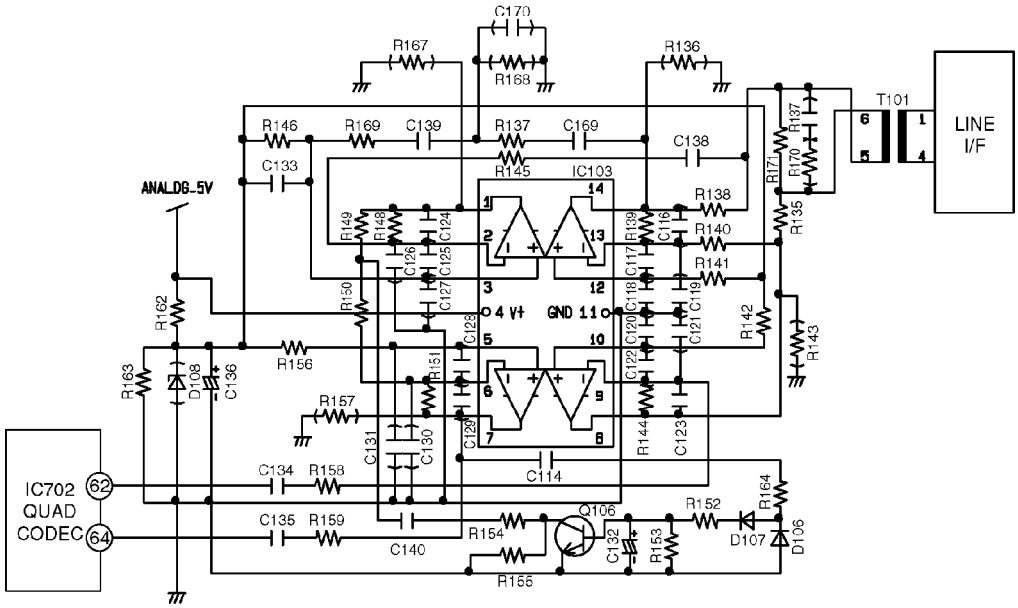
LINE1: C469 → R437 → C439 → R469 → pin3 of IC403
LINE2: C369 → R337 → C339 → R369 → pin3 of IC303
LINE3: C269 → R237 → C239 → R269 → pin3 of IC203
LINE4: C169 → R137 → C139 → R169 → pin3 of IC103

7.9. ALC Circuit (Auto Level Control)

This circuit prevents the input of distorted waveforms to IC702 when a large signal is received from the line.
This is because normal analog-to-digital conversion cannot be performed if distorted waveforms are input during analog-to-digital conversion.
The circuit monitors the amplifier output and lowers the input level of the amplifier if it reaches a certain level.

Operation Route:

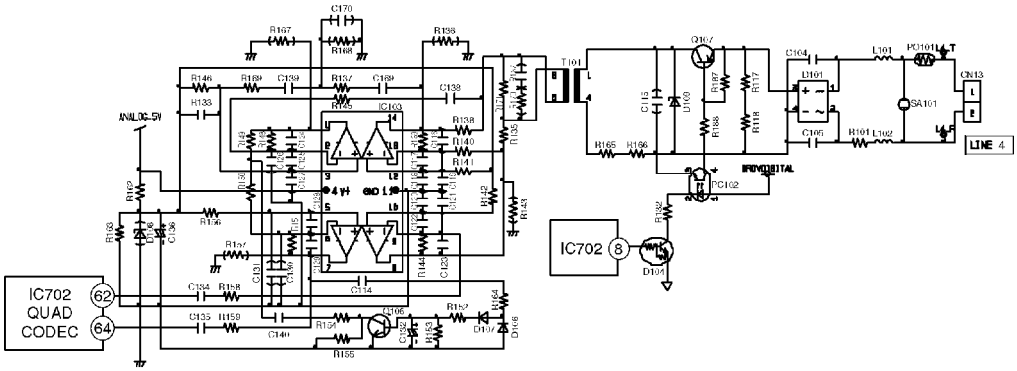
LINE1: pin7 of IC403 → R464 → D407 → R452 → Q406 → R454 → C440 → R450 → pin6 of IC403
LINE2: pin7 of IC303 → R364 → D307 → R352 → Q306 → R354 → C340 → R350 → pin6 of IC303
LINE3: pin7 of IC203 → R264 → D207 → R252 → Q206 → R254 → C240 → R250 → pin6 of IC203
LINE4: pin7 of IC103 → R164 → D107 → R152 → Q106 → R154 → C140 → R150 → pin6 of IC103



7.10. DTMF SIGNAL

When the DTMF data from the Handset is received, the DTMF signal is output from some one IC104, IC204, IC303, IC403, according to the Line used, and sent to the line through IC702.

LINE1: IC702 pin51 → IC403 → T401 → D401 → T/R
LINE2: IC702 pin53 → IC303 → T301 → D301 → T/R
LINE3: IC702 pin60 → IC203 → T201 → D201 → T/R
LINE4: IC702 pin62 → IC103 → T101 → D101 → T/R

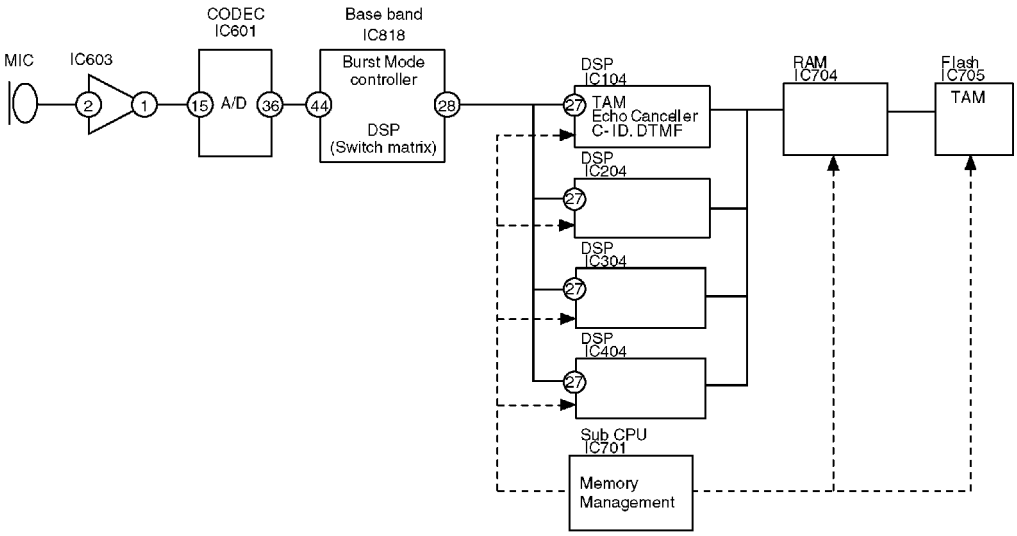


7.11. Telephone Answering

Function:
When in Telephone Answering Mode, the unit automatically answers the call, asking the caller to leave a message, then records the caller´s incoming message.

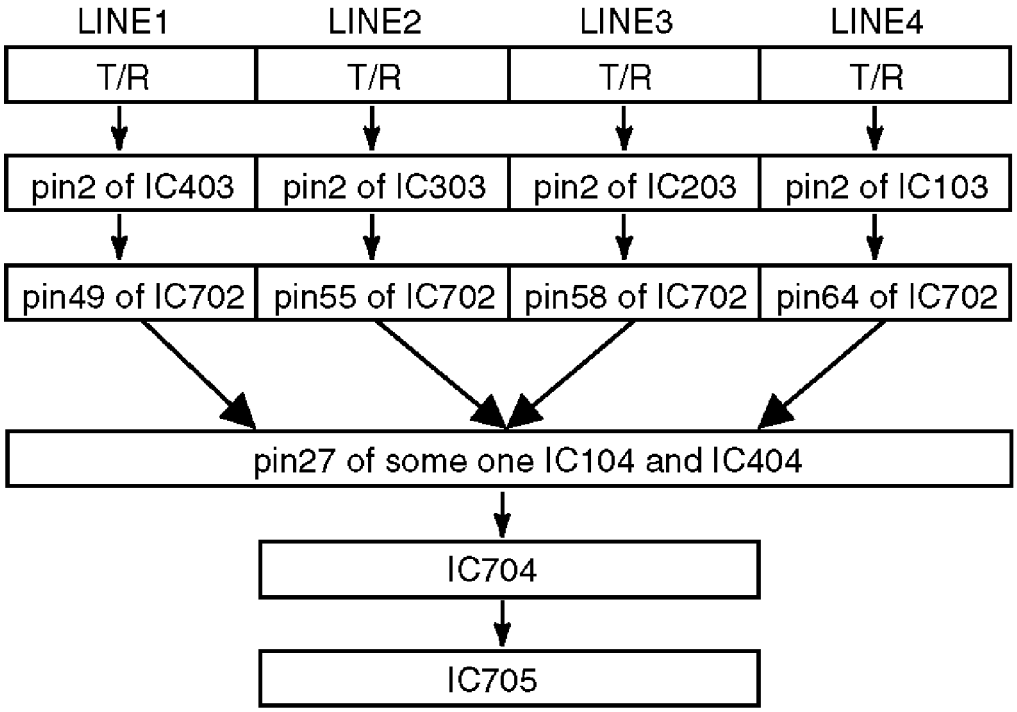
7.11.1. Mic Input Signal Path

Mic → pin2 of IC603 → pin15 of IC601 → pin44 of IC818 → pin27 of some one DSP IC104 and IC404 → Data lines of IC704 → Data lines of IC705

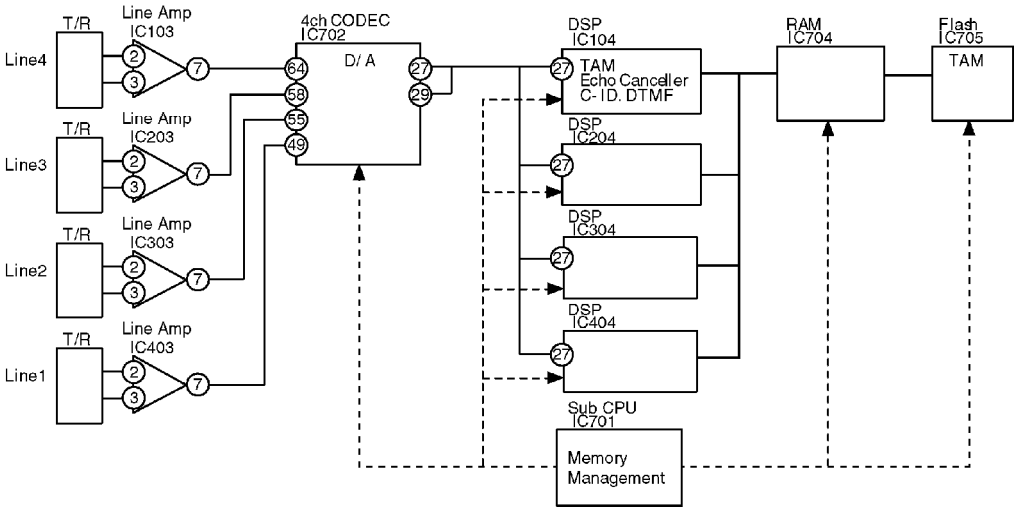


7.11.2. Reception signal path (In case of Line4)

The input signal from the telephone line is sent through the circuit via the following path: / T/R → pin2 and pin3 of IC103(differential) → pin64 of IC702 → pin27 some one DSP of IC104 and IC404 → Data lines of IC704 → Data lines of IC705
DSP IC104 and IC404 provides voice prompting, voice recording and playback function. The voice data are stored in the Flash memory IC705.
The voice data is controlled via Sub CPU IC701. Sub CPU manages Flash memory IC705 and IC704 so that DSP IC104 and IC404 can use the same Flash memory.

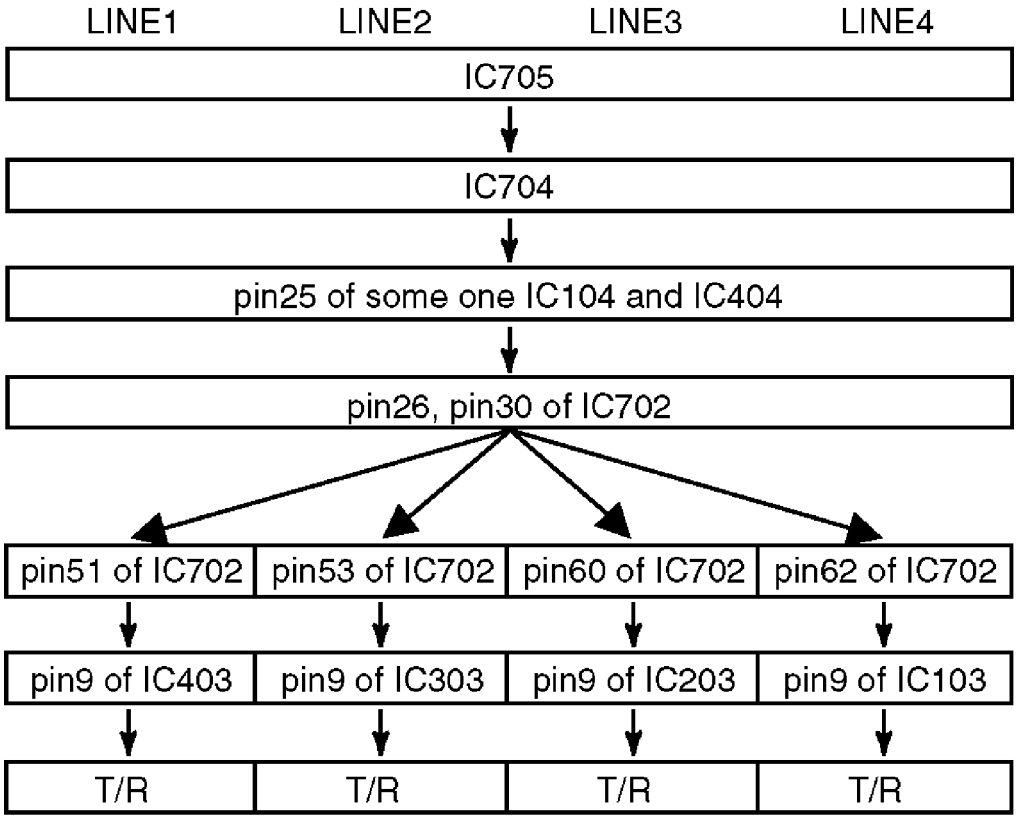


Telephone Answering Mode

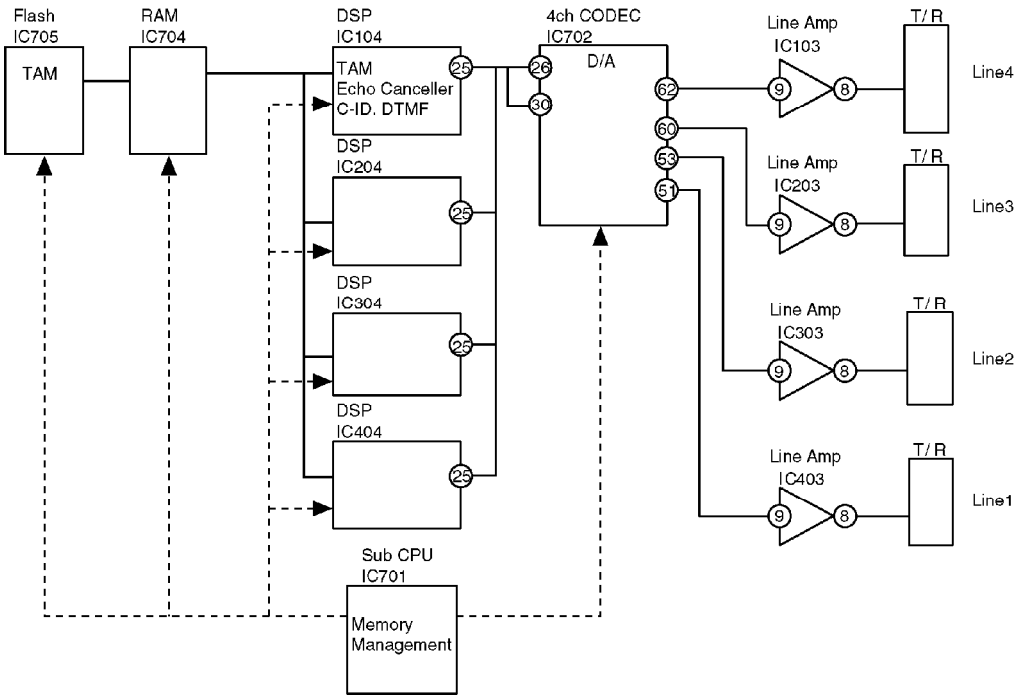


7.11.3. Transmission Signal Path (In case of Line 4)

The output signal to the telephone line is sent through the circuit via the following path: / IC705 → IC704 → 25pin of some one DSP IC104 and IC404 → pin26 and pin30 of IC702 → pin9 of IC103 → T/R

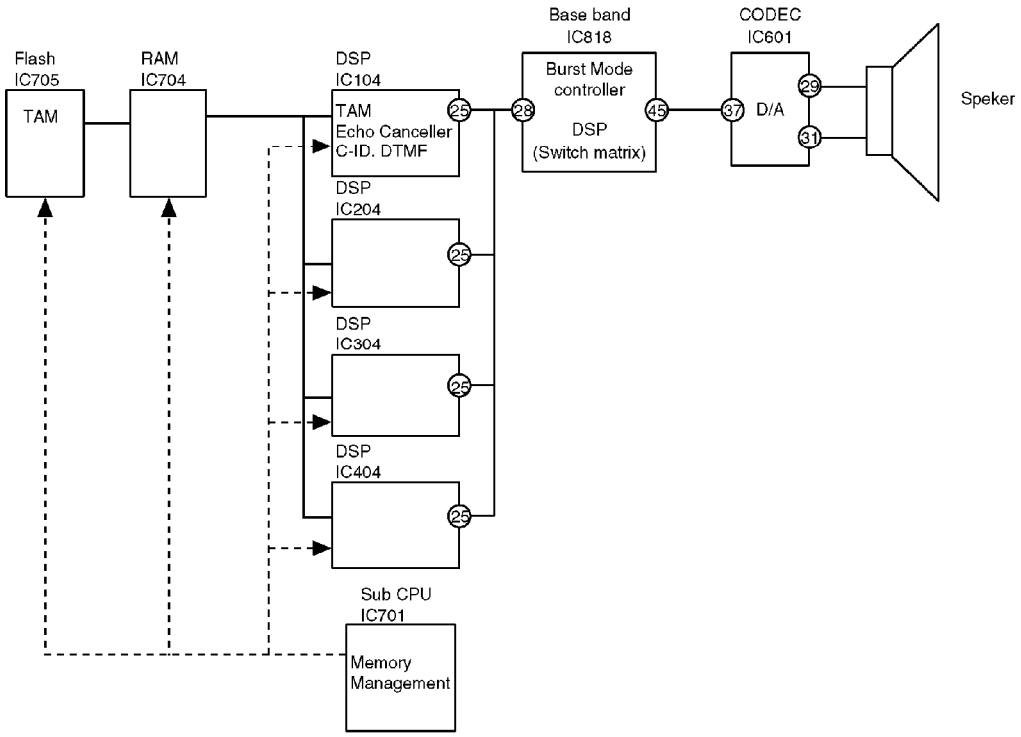


Telephone Answering Mode



7.11.4. Speaker Output Signal Path

IC705 → IC704 → 25pin of some one DSP IC104 and IC404 → pin28 of IC818 → pin37 of IC601 → SP

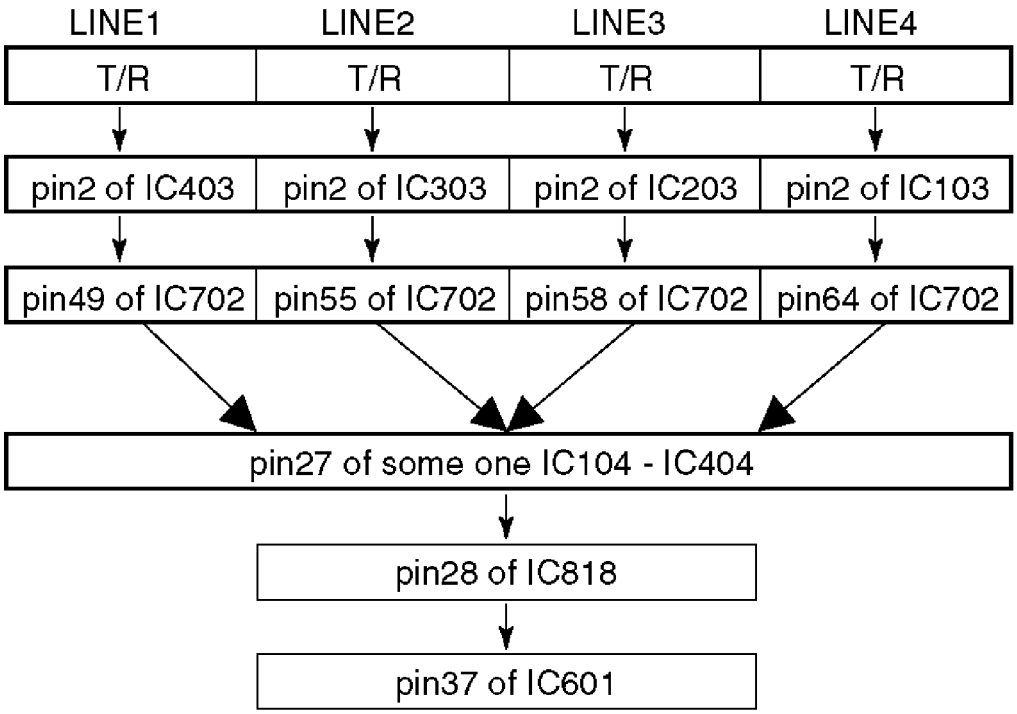


7.12. Speakerphone Mode

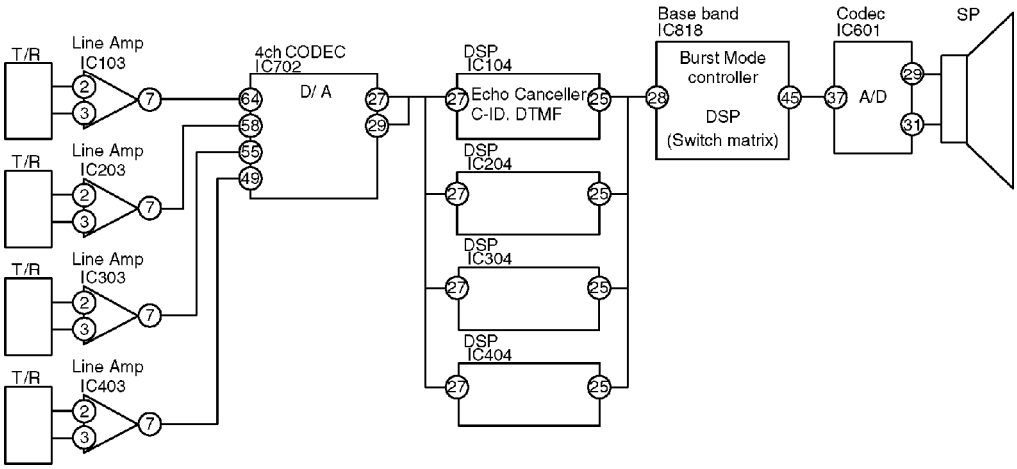
This circuit is used when the unit is used in the hands-free mode.

7.12.1. Reception signal path (In case of Line 4)

The input signal from the microphone is sent through the circuit via the following path: / T/R → pin2 and pin3 of IC103 (differential) → pin64 of IC702 → pin27 of some one DSP IC104 and IC404 → pin28 of IC818 → pin37 of IC604 → SP

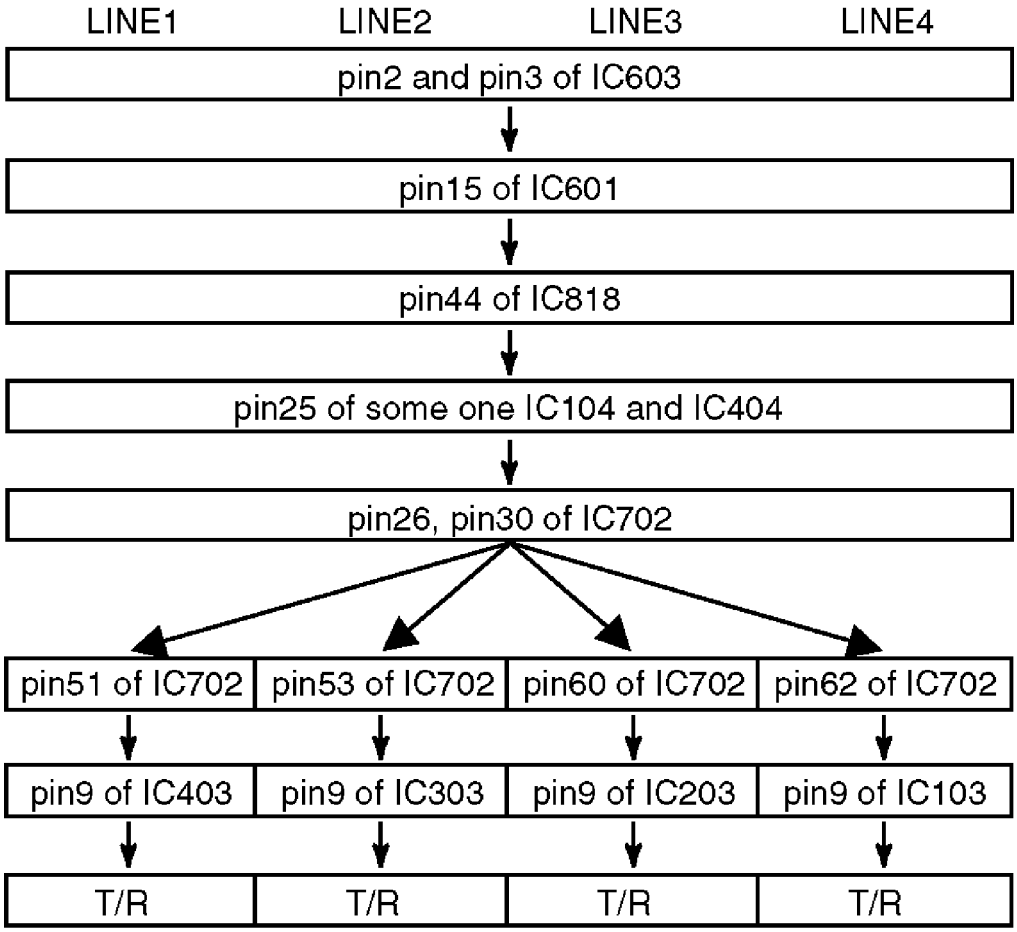


Speakerphone Mode

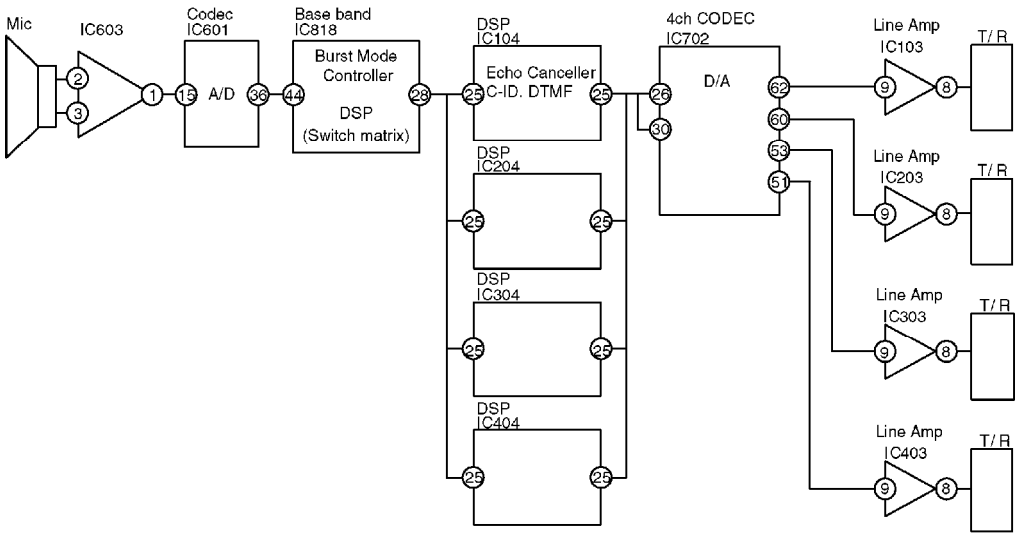


7.12.2. Transmission signal path (In case of Line4)

The input signal from the microphone is sent through the circuit via the following path: / Mic → pin2 and pin3 of IC603 (differential) → pin15 of IC601 → pin44 of IC818 → pin25 of some one DSP IC104 and IC404 → pin26 and pin30 of IC702 → pin9 of IC103 → Telephone Line



Speakerphone Mode

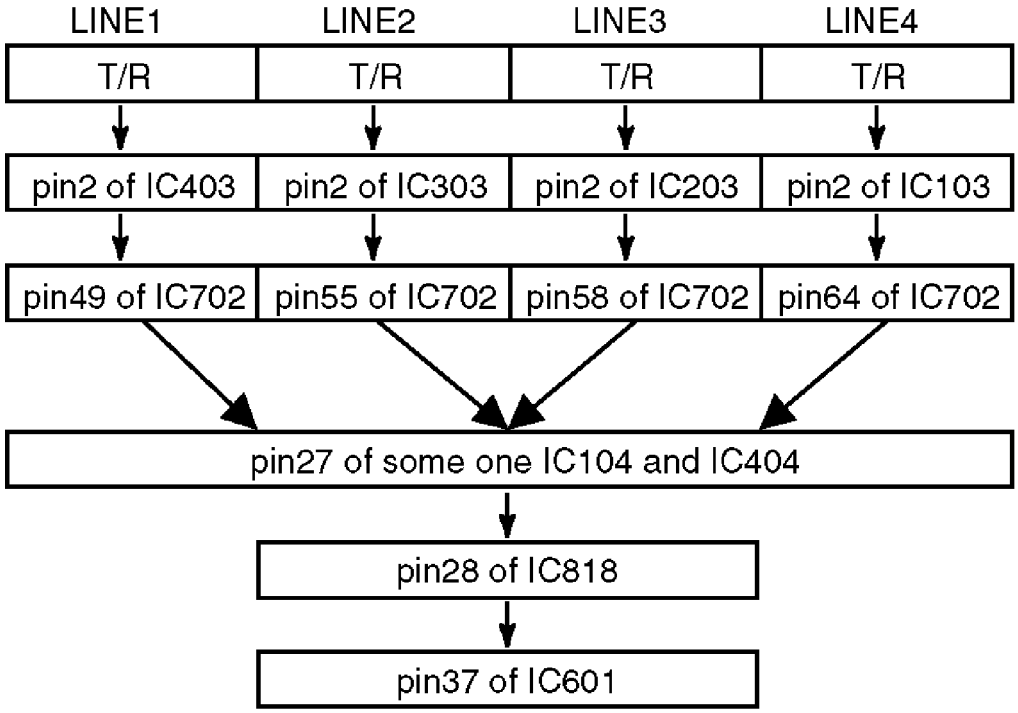


7.13. Handset Mode (Line Receiving)

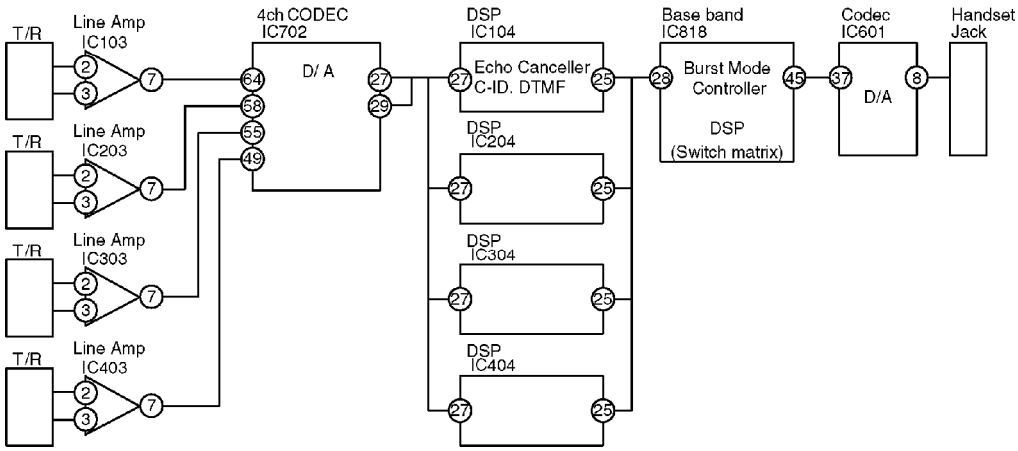
7.13.1. Reception signal path

The audio signal from line transformer T101 - T401 is input to IC103 - IC403. IC103 - IC403

comprise line amplifier. These signals are output to pin64, 58, 55, 49 of IC702, according to Line2 - Line1. IC702 converts the signals into 8bit u-law data and sends to pin27 of IC104 and IC404. DSP IC104 and IC404 execute echo cancellation and DTMF reception for one channel each, and send the data to IC818. IC818 then sends the data to pin37 of IC601. IC601 converts the data into analog audio signal and sends to handset.



Handset Mode



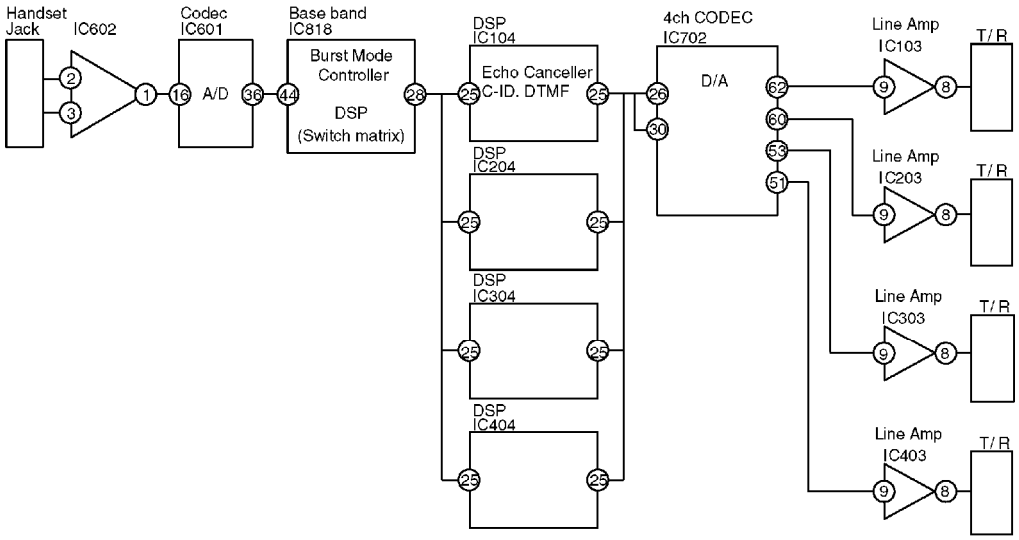
7.14. Handset Mode (Line Sending)

The audio signal and control data for 4 lines are sent by Time Division Duplex, sharing the same signal path.

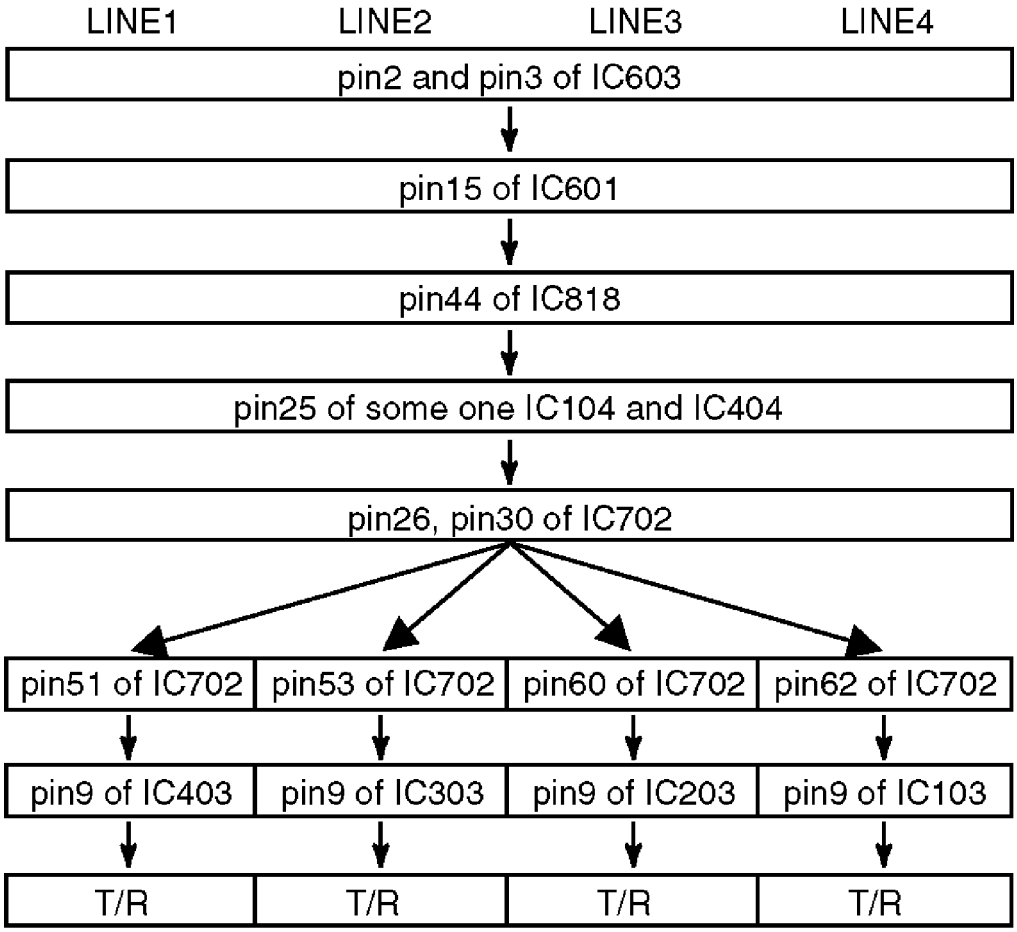
The analog audio signal of Handset Jack are input to pin2 and pin 3 of IC602, it comprises handset mic amplifier. IC601 converts the data to 8-bit u-law-encoded and sends to pin23 of IC818, then sends to pin25 of some one DSP IC104 and IC404. DSP IC104 and IC404 executes echo cancellation for Line1 - Line4 each.

Then the data is sent to pin26 and pin 30 of IC702. IC702 converts the data into analog audio signal and sends to pin9 of line amplifier IC103 - IC403. Then the signal is input to transformer T301 - T401.

Handset Mode



Transmission Signal Path

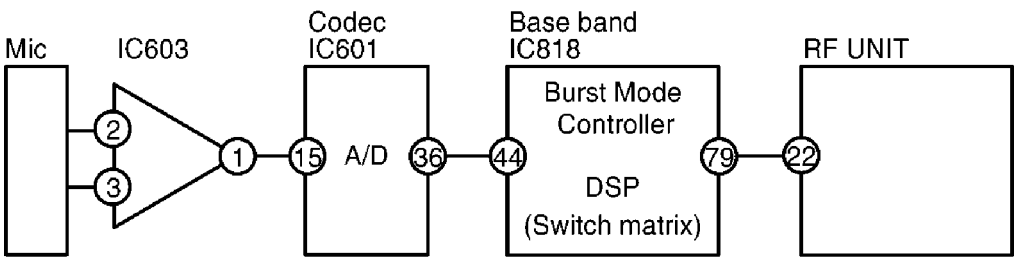


7.15. Intercom Mode

When the set is in Intercom Mode, the input signal from the microphone is sent through the circuit via the following path: Mic → pin2 and pin3 of IC603(differential) → pin15 of IC601 → pin44 of IC818 → RF Unit

The audio signal from Mic is input to IC603. IC603 comprise Mic amplifier
This signal is input to pin15 of IC601.
IC601 converts the signal into 8bit u-law data and sends to pin44 of IC818.
IC818 converts the data into digital TX data of ADPCM, then sends to pin22 of RF Unit.

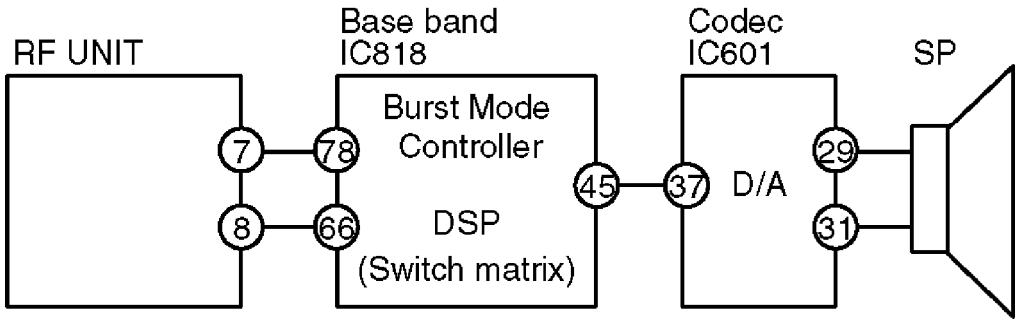
Intercom Mode



The signal from the RF Unit is sent through the circuit via the following path: / RF Unit → pin78 and pin66 of IC818 → pin37 of IC601 → SP

The digital RX data of ADPCM and its inverted data from pin7 and pin8 of RF Unit are input to pin78 and pin 66 of IC818. IC818 converts the data to 8-bit u-law-encoded and send to pin37 of Codec IC601. IC601 converts the data into analog audio signal and sends to Speaker.

Intercom Mode



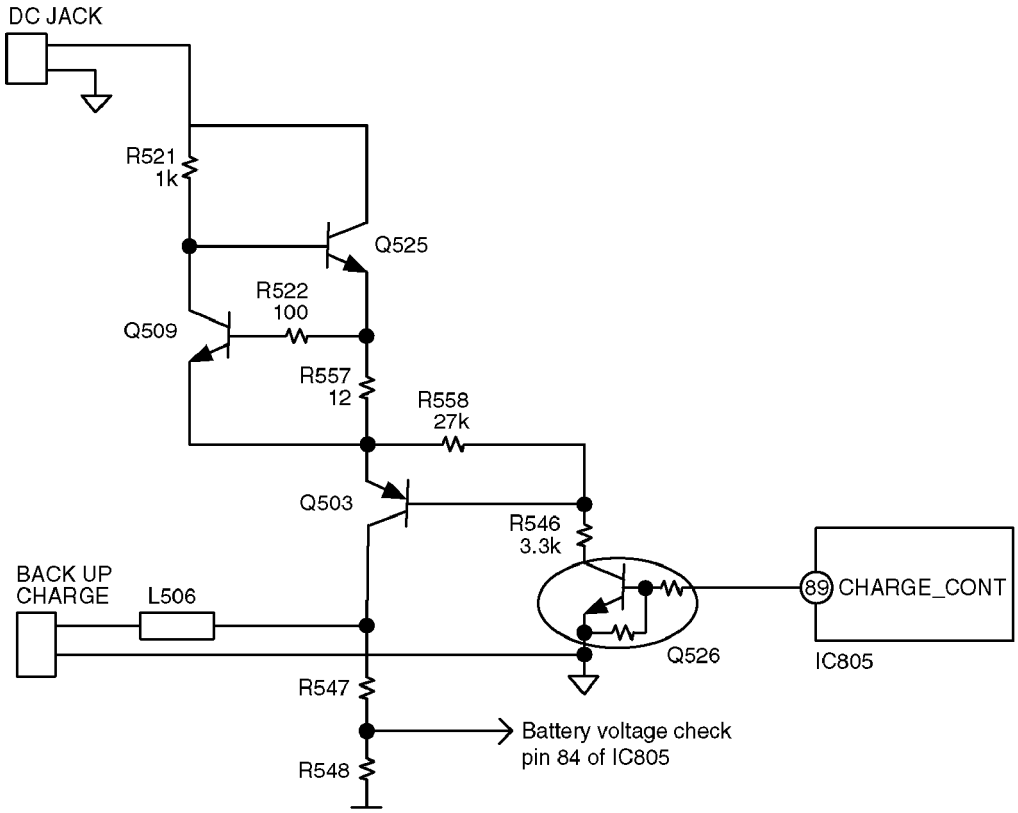
7.16. CHARGE CIRCUIT

The backup-battery is provided to cope with AC adaptor power failure. The voltage from the AC adaptor is supplied to the backup-battery through Q525, Q509 and Q503. They comprises constant current circuit to prevent from flowing too much current.
While Q526 is OFF, IC805 checks pin84 to monitor the battery's voltage and the battery's existence.
IC805 fluctuates pin89 periodically to switch Q526, so that it controls the charge current. Ordinarily the mode is in trickle charge (18mA) to prevent overcharging. Once the backup-battery is used, normal charge (50mA) is started soon after the AC power recovers, then it changes to trickle charge.
In order to control the current, pin89 of IC805 fluctuates and Q526 and Q503 repeats ON/OFF, so that the current is reduced. When in trickle mode, the period that Q526 is OFF becomes longer, so that the average current is reduced. When in normal mode, the period that Q526 is OFF becomes shorter.

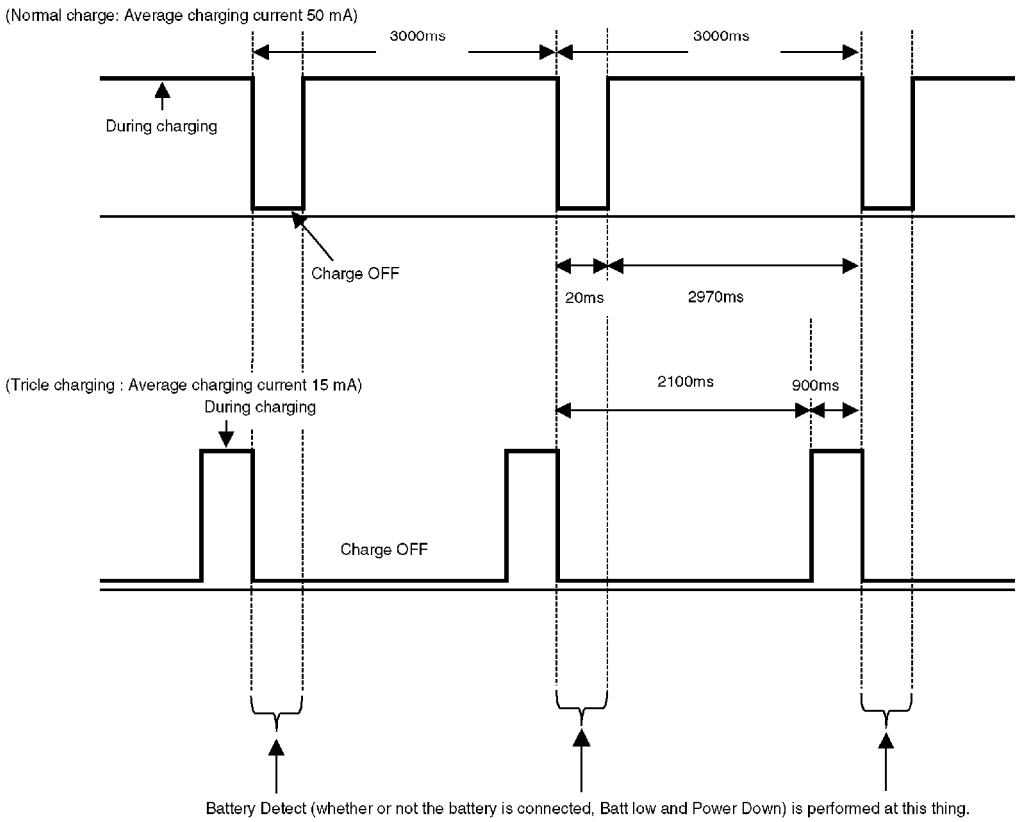
Power failure operation circuit

When AC power failures, the voltage at pin56 of IC805 becomes low. In case that the battery is connected, IC805 immediately (within 2ms) turns pin55 high to turn Q524, Q516 and Q514 ON, so that the current from backup-battery is fed instead of AC power to each block. This makes Q505 and Q504 not to send STOP signal, resulting IC805 operation continue.
In case that the battery is NOT connected and AC power failures, the voltage at pin56 becomes low but IC805 keeps pin55 low to maintain Q524, Q516 and Q514 OFF, so that the current to each block is stopped. So, Q505 and Q504 sends STOP signal, resulting IC805´s operation stop.
According to the battery´s voltage appeared at IC805 pin84, the output from IC805 changes so that battery´s status is shown by Backup LED Q909.

battery	AC power	battery´s voltage	backup LED	status
exists	alive	-----	lights	battery exists (operational at powe
exists	failure	high	lights	power failure but operational
exists	failure	low	flashes	battery low
exists	failure	lower	lights out	NO power failure operation
none	alive	-----	lights out	NO power failure operation



7.16.1. Charge Control

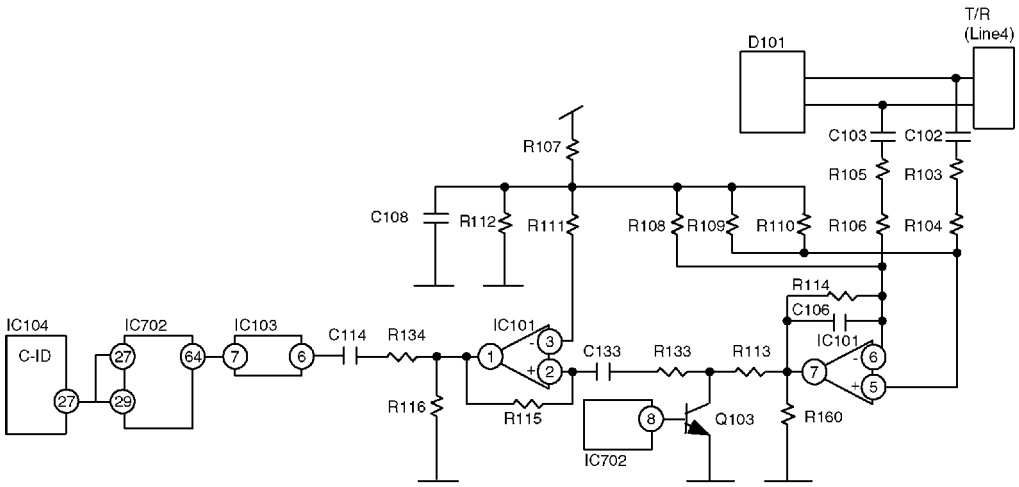


7.17. Calling Line Identification Circuit (Caller ID)

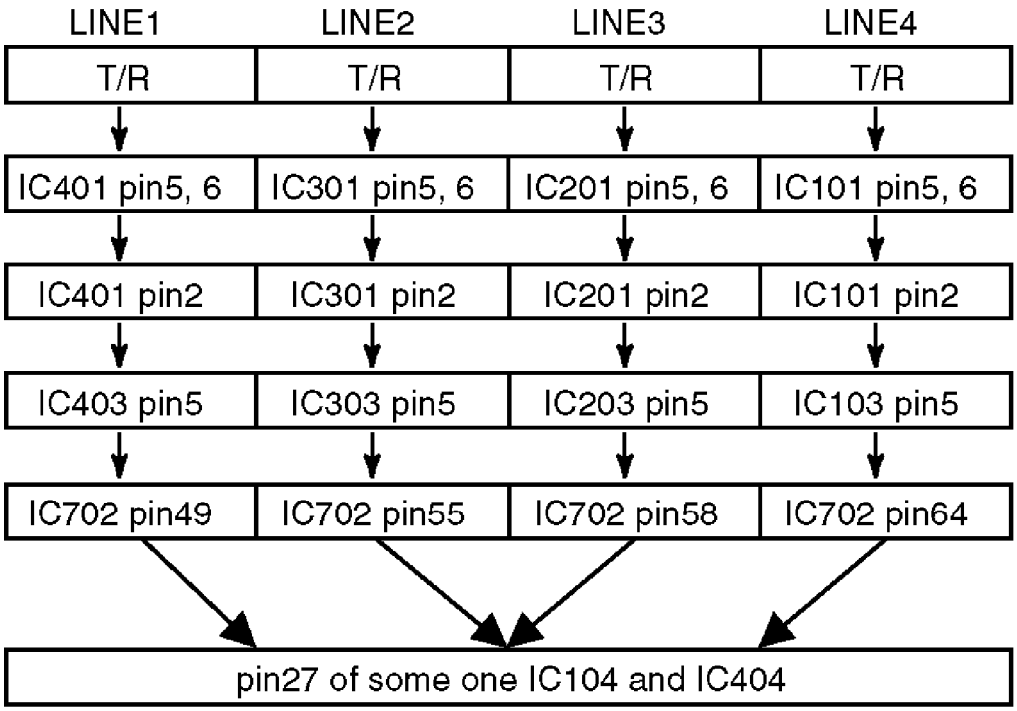
The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200Hz sine wave, and data "1" is a 2200Hz sine wave. There are two types of the message format which can be achieved: i.e. The single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

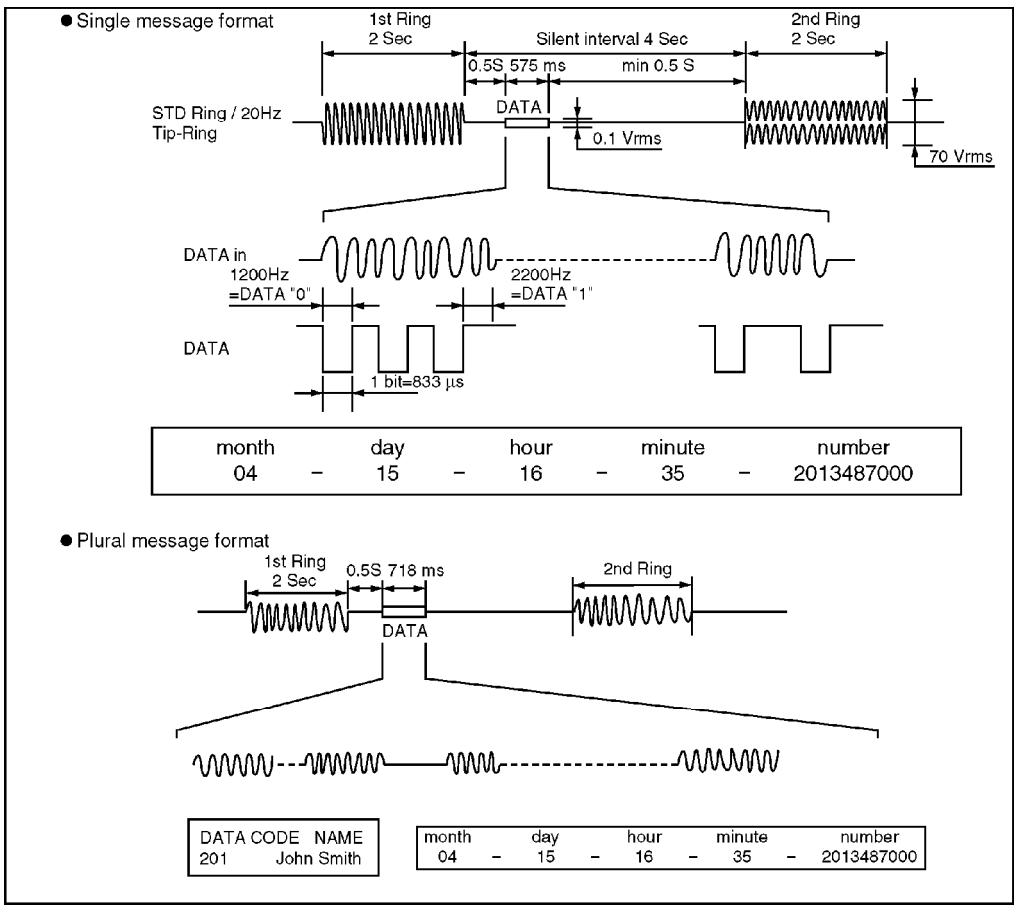
Call IC path:

As for Line 4, the Call ID signal flows from T/R → IC101 5, 6pin → IC101 2pin → IC103 6pin → IC702 64pin → IC104 27pin



Call-ID Signal path

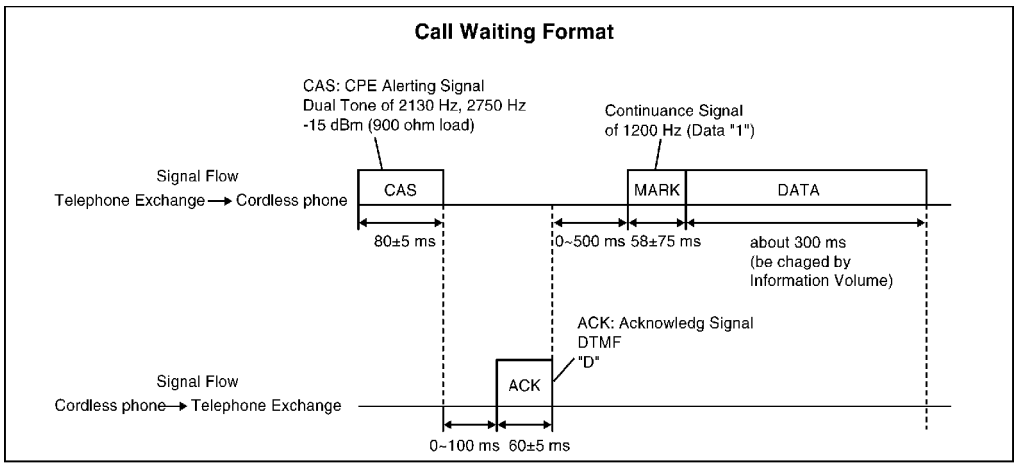




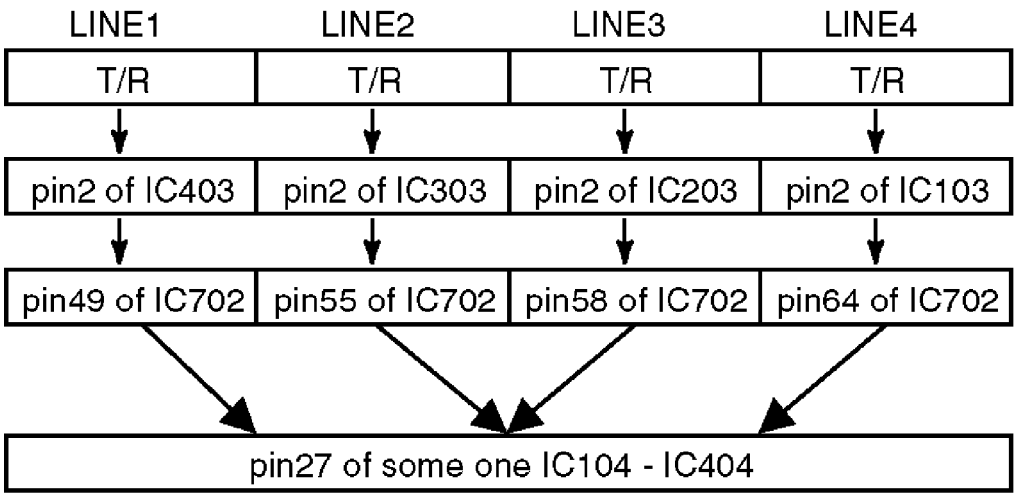
7.18. Call Waiting

Calling Identity Delivery on Call Waiting (CIDCW) is a CLASS service that allows a customer, while off-hook on an existing call, to receive information about another calling party. The transmission of the calling information takes place almost immediately after the customer is alerted to the new call so the person can use this information to decide whether to take the new call.

As for Line 4, the CAS signal flows from T/R → T101 → IC103 → IC702 64pin (same to voice signal path), and the ACK (DTMF signal) is returned to the telephone exchange. The telephone exchange that received the ACK can send the data in the same manner as the caller ID. If the telephone deems that a telephone connected in parallel is in use, ACK is not returned even if CAS is received, and the information for the second and subsequent callers are not displayed on the display.



Call waiting Signal path



7.19. Parallel Connection Detection Circuit

In order to disable call waiting functions when using telephones connected in parallel, a circuit that determines whether a telephone connected in parallel is in use or is not. This circuit determines whether the telephone connected in parallel is on hook by detecting changes in the T/R voltages.

Circuit Operation

Detection of parallel connection in on-hook conditon.

When on hook, the voltage at pin81,82 of IC805 is monitored. There is no parallel connection if the voltage is 1.8V or higher, while a parallel connection is detected to exist the telephone connected in parallel in OFF-HOOK conditon if the voltage is lower.

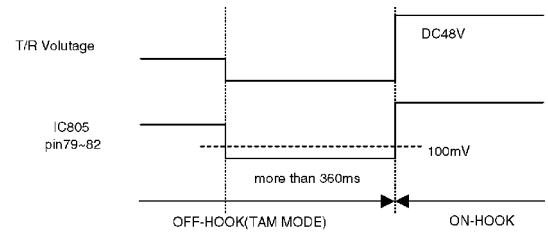
Detection of parallel connection on OFF-HOOK condition

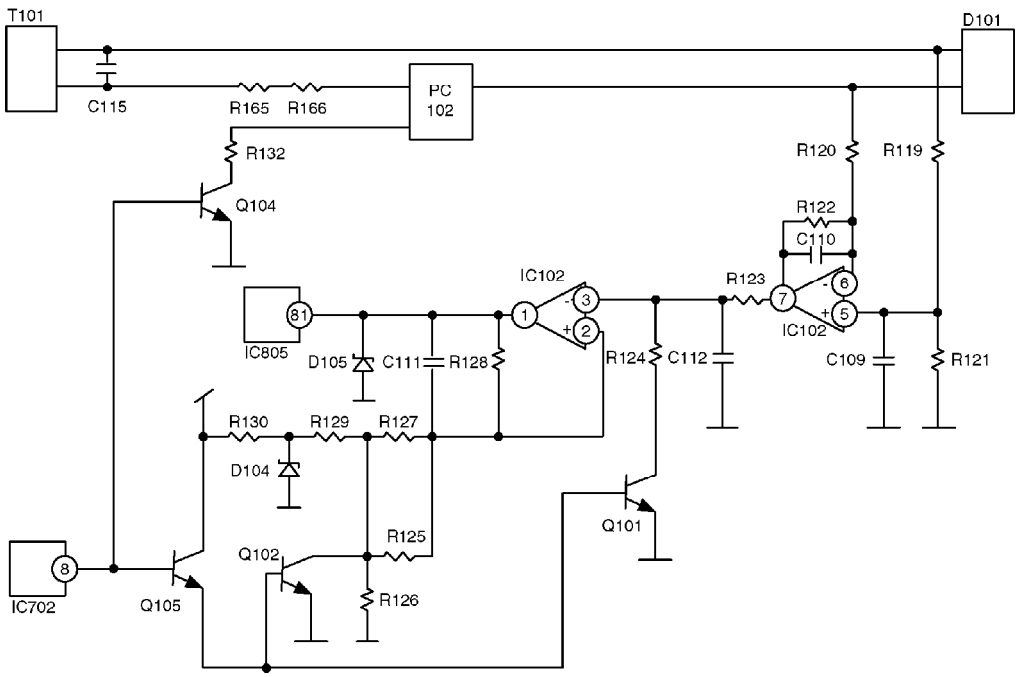
When off hook, the voltage at pin79, 80, 81,82 of IC805 is monitored; the presence/absence of a parallel connection is determined when the voltage changes by 0.1V or more.

CPC Detection

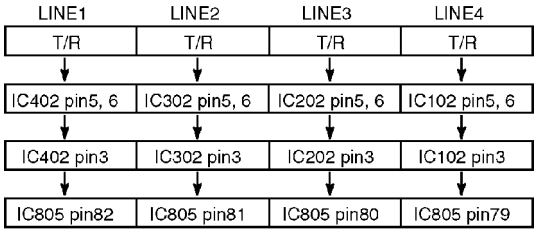
When the TAM receives a call, the unit becomes ON-HOOK if receiving the CPC signal which is output from the exchanger after the other party's TEL line is disconnected.

The line monitoring starts as soon as the TAM receives a call. If the voltage of the IN USE detection circuit at pins 79~82 of IC805 has been 0.1 V or below for 360 ms or more, the unit judges that the CPC signal is detected then the line is disconnected automatically.





Parallel Detection path



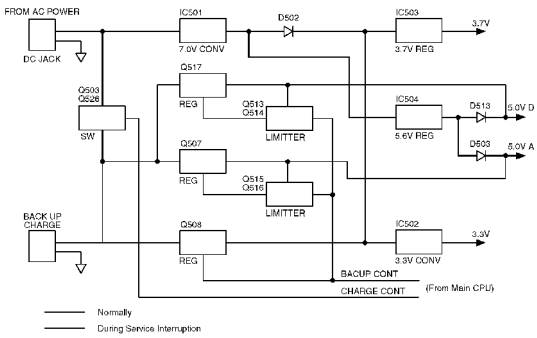
STOP

When the AC power is installed, the circuit consisting of IC819 outputs low signal until the 3.3V power from IC502 exceeds 2.7V. While this remains low, CPU IC805 stops its oscillation.

Fluctuation of Power Source

		AC Power Source (V)			Vbat (V) During Service Interruption Operation				Remarks
Power Source	Point of Measurement	102	120	138	6.0	6.6	7.2	8.4	
7V Reg	0502 IN	6.88	6.82	6.82	-	-	-	-	Not Operate during Ser Interruption
3.7V Reg	IC503 2pin	3.8	3.72	3.72	3.74	3.74	3.74	3.74	
5.6V Reg	IC504 2pin	5.66	5.64	5.66	-	-	-	-	Not Operate during Ser Interruption
3.3V Reg	IC502 3pin	3.34	3.32	3.34	3.34	3.34	3.34	3.34	
5.0V D	D513 OUT	4.94	4.92	4.9	5.26	5.26	5.26	5.24	to BBIC
5.0V A	D503 OUT	4.94	4.94	4.96	5.02	5.02	5	4.98	

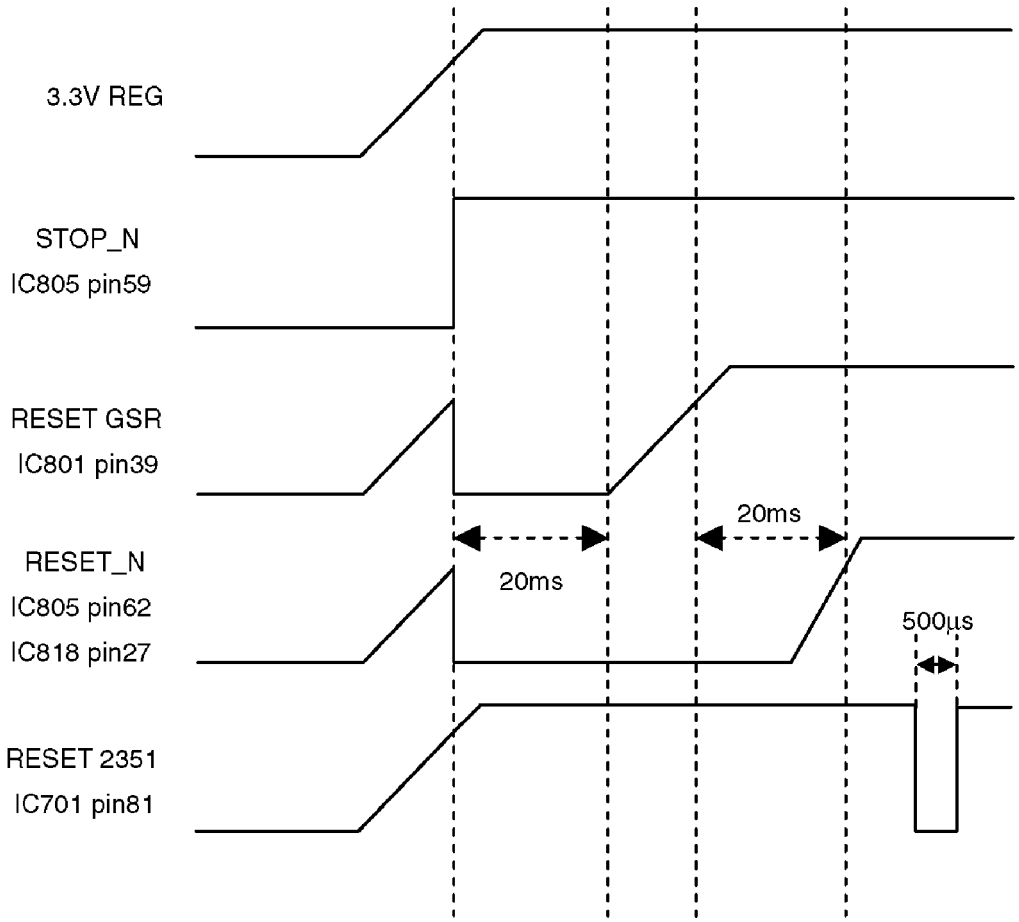
Reference

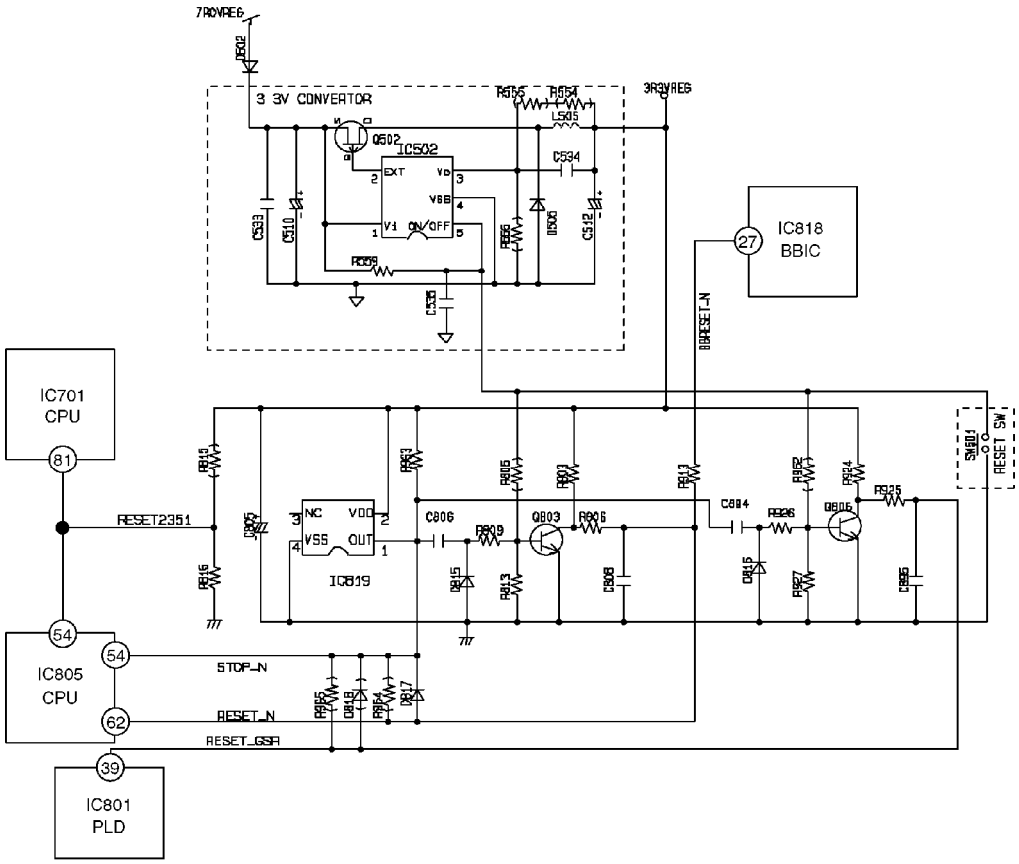


Reset

When the AC power is installed, the reset circuit consisting of IC819,Q803 and Q806 outputs low signal to pin62 of CPU IC805, pin 27 of IC818 and pin 39 of IC801. After about 20ms, pin39 of IC801 becomes high first.

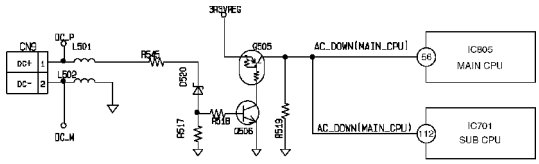
Then after 20ms later from pin39 of IC801,pin62 of IC805 and pin27 of IC818 become high. When the signal change from low to high, these 3 IC are reset and initialized. Pin 54 of IC805 remains low until its software has started, A reset signal to pin81 of Sub CPU IC 701 is at least 500 μ s second. When a reset signal ia raised and the clock output from pin 69 of IC805 to pin85 of IC701 is stable, the software of Sub CPU IC701 is started. After pressing reset switch, adjustment of time and date needs. When base unit is working by only back-up battery, if reset switch is pressed, CPU stops working. Because base unit starts working by AC power in initial use.





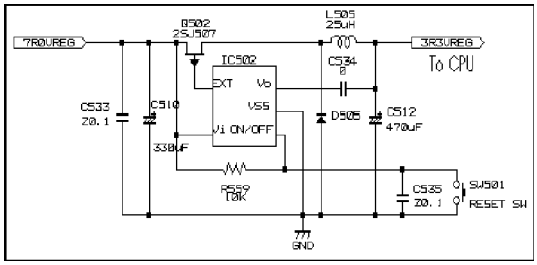
AC power down

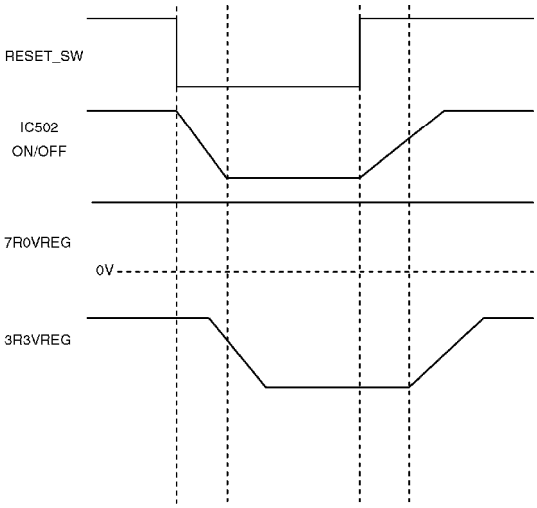
When the AC power failure happens, the output from Q505 to pin56 of IC805 and pin 112 of IC701 goes low. Then MAIN CPU IC805 and Sub CPU IC701 starts power down operation.

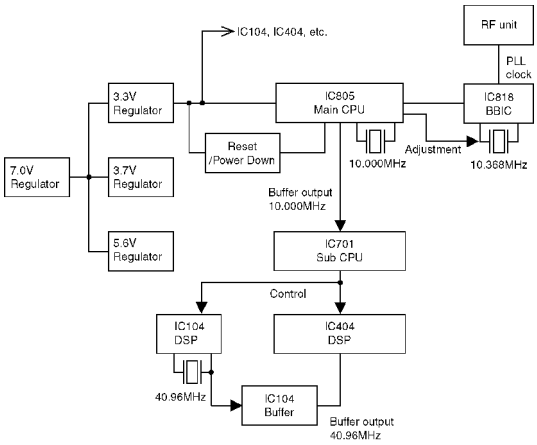


Reset Switch

Reset switch is final method to recover Base Unit when it doesn't work.
Regulator of 3.3V (IC502: for power supply of CPU) turns off while the switch is pressed.
After release the switch, Base Unit starts again and be initialized.
Base Unit forgets date and time, but the other data are remaining.
After pressing switch, adjustment of time and date needs. When base unit is working by only back -up battery, if reset switch is pressed, CPU stops working. Because base unit starts working by AC power in initial use.

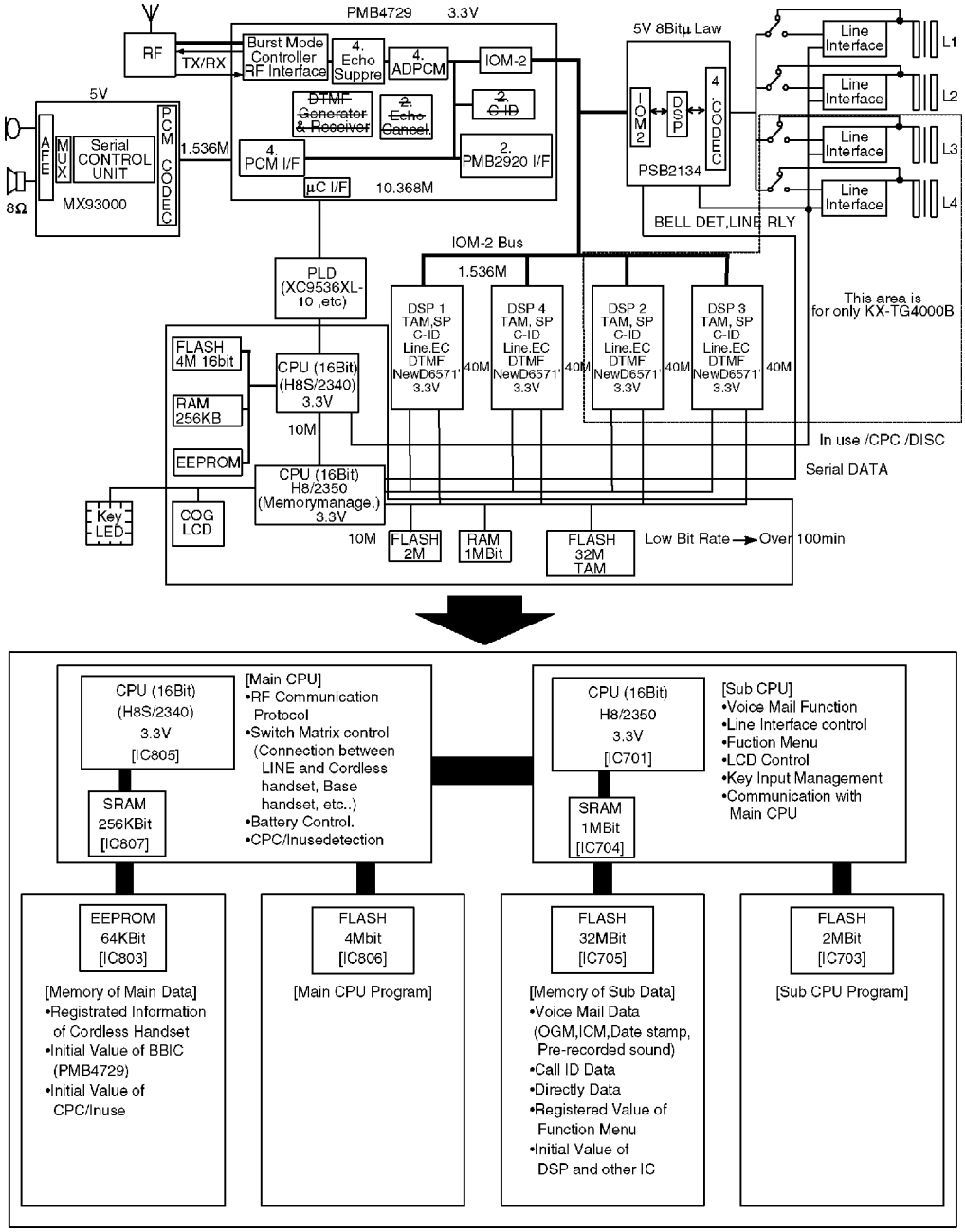






7.20. Memory

Base unit has 4 Memory IC, CPU for Main and CPU for Sub. Role of each IC are follows.



8. CIRCUIT OPERATION (CORDLESS HANDSET)

8.1. Power Supply Circuit

The circuit diagram below shows the block for activation control of the 1 chip IC of the cordless handset, and the power source circuit.

The cordless handset is automatically switched ON if a high pulse or high signal is input to the ON port (pin 110 of IC1) or the CDT port (pin 111 of IC1). Then, if VDDB (pin 109 of IC1) is 2.0 V or more, the DCDC converter is activated. And when the LRSENSE port (pin 120 of IC1) reaches 2.65 V -10%, internal RESET is input to the analog block and digital block, so all circuits are activated.

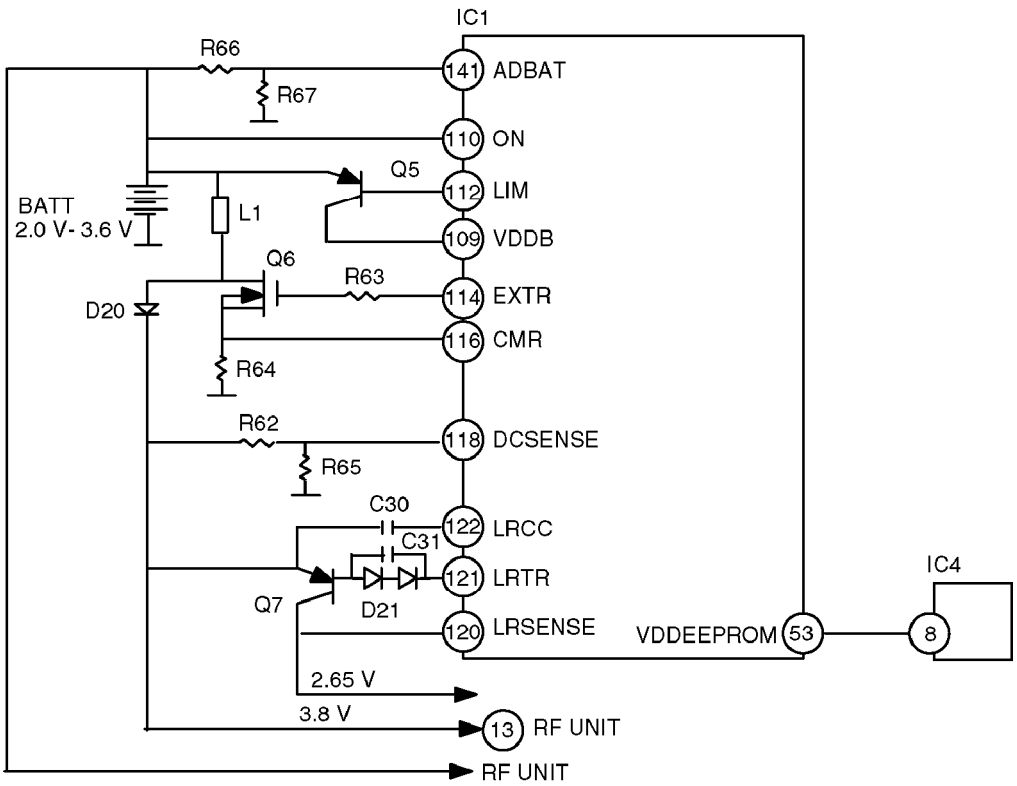
DCDC Converter

This is comprised of Q6, L1, R63, R64, D20, C27, C26, EXTR (pin 114 of IC1), CMR (pin 118 of IC1),

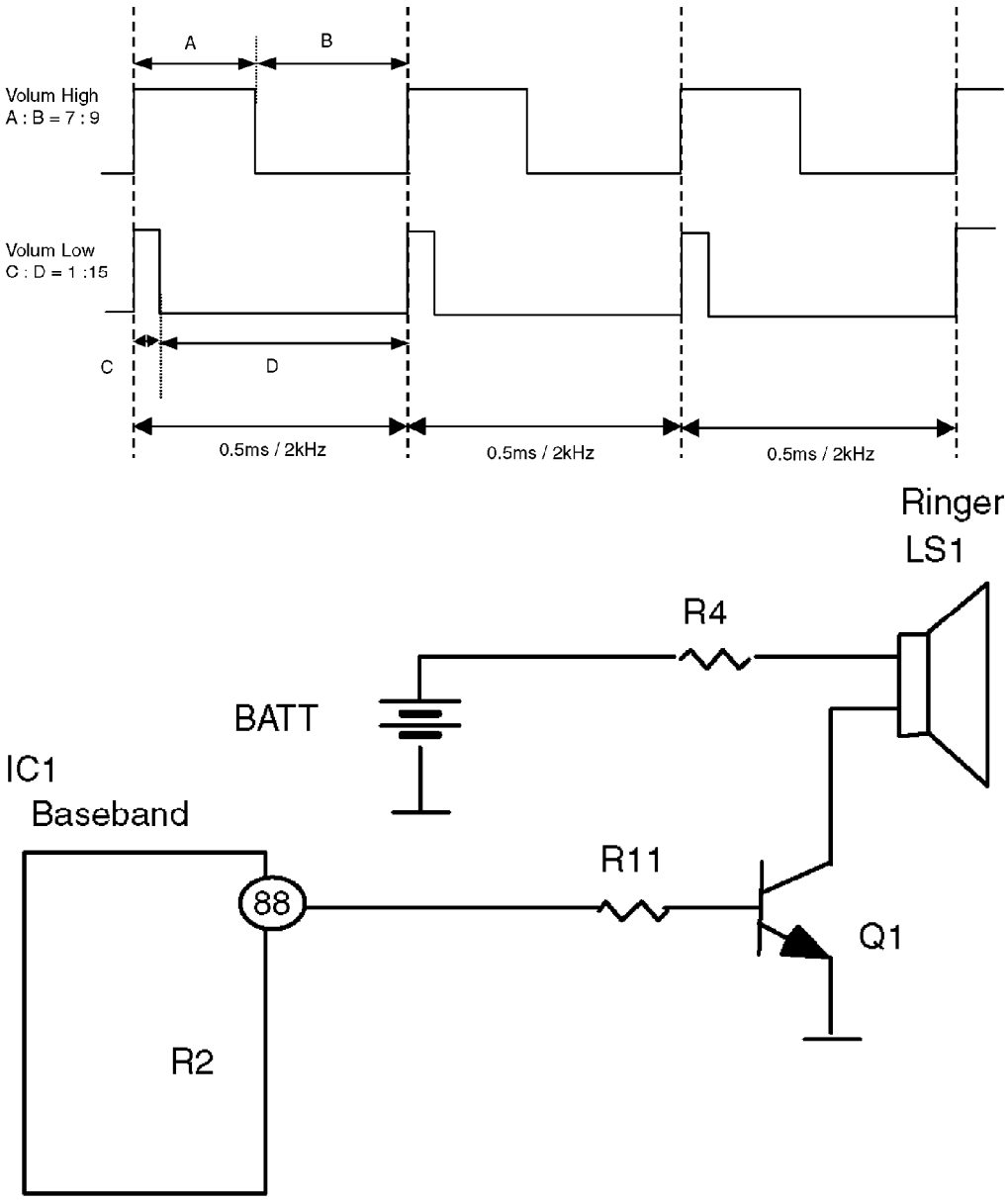
and DCSENSE (pin 118 of IC1). With a standard input of 2.4 V, an output voltage of 3.8 V is generated.
EXTR (pin 114 of IC1) is the port for Q6 control, and DCSENSE (pin 118 of IC1) is the standard input port of the DCDC converter.CMR (pin 118 of IC1) is the port for L1 current control. It uses R64/0.1 Ω to limit the current to 1.9 A.

Regulator
This is comprised of Q7, D21, C31, C34, C35 and LRTR (pin 121 of IC1), LRCC (pin 122 of IC1) LRSENSE (pin 120 of IC1). Input of 3.8 V is regulated to 2.65 V.
LRTR (pin 121 of IC1) is the port for Q7 control, LRCC (pin 122 of IC1) is the port for AC input to the regulator, and LRSENSE (pin 120 of IC1) is the standard input port.

LIM (pin 112 of IC1) is the port for battery limiter control. It is this port which controls Q5 and controls input to VDDB (pin 109 of IC1).
ADBAT (pin 141 of IC1) is the port that monitors the battery voltage. It detects battery LOW if the voltage is 2.35 V or less.
VDD EEPROM (pin 53 of IC1) is the power output port for the external EEEPROM.



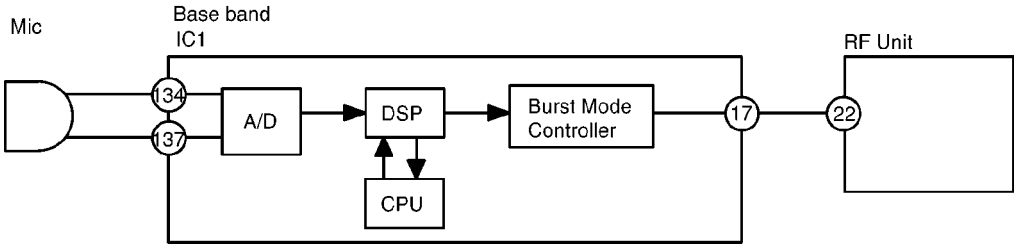
The power for sounding from ringer is supplied from Battery.
The signal for driving the ringer is supplied from pin88 of Baseband IC1, and turns Q1 ON and OFF.
The ringer volume is controlled by the Pulse Width of the signal.
The ringer volume can be switched between HIGH and LOW. The volume is controlled by changing the duty ratio of the signal output from pin 88 of IC1.



8.2. Sending Signal Circuit

When selected TALK key, Cordless handset go into TALK mode. / The audio signal from microphone is inputted to pin 134 and pin 137 of IC1 with Balance. / In the IC1 the audio signal is coded to Linear-PCM signal and also companded to LOG-PCM signal in DSP block.
The LOG-PCM signal goes from DSP block to BMC block is transcoded to ADPCM Signal and formed TX data.
The TX data goes out from pin 17 of IC1 is inputted to pin 22 of RF unit. The modulated signal goes out from RF unit to antenna.

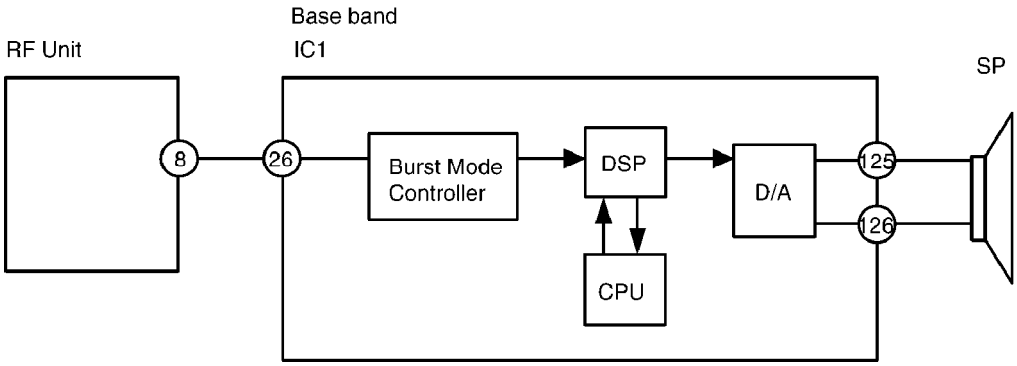
Transmission Signal



8.3. Reception Signal Circuit

A signal is received by antenna is inputted to RF unit. / In the RF unit the received signal is demodulated and shaped digital base band signal. ADPCM transcoder of IC1. / The digital base band signal goes from pin 8 of RF unit is inputted to pin 26 of IC1.
In the IC1, BMC block pick up ADPCM signal from digital base band signal and pass to the ADPCM transcoder of IC1. / In the ADPCM transcoder the incoming ADPCM signal is transcoded to LOG-PCM signal, u-law.
The LOG-PCM signal goes from BMC block to DSP block is expanded to Linear-PCM and decoded to audio signal. / The audio signal goes from pin 125 and pin 126 with balance to speaker.

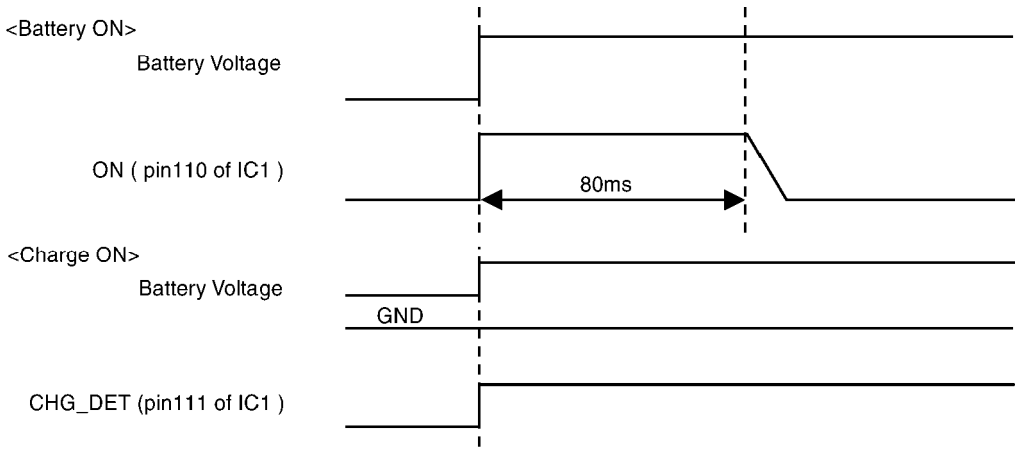
Reception Signal



8.4. Reset

Reset occurs under the following conditions.

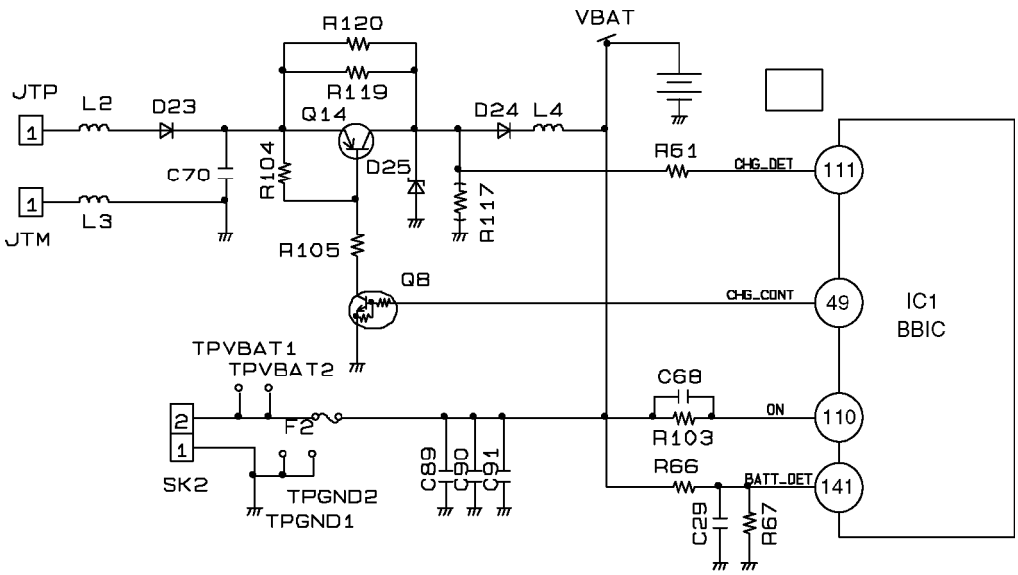
1. **When the battery voltage is 2.2 V or more and the battery is inserted.**
2. **When the battery is recharged.**
   At the start of charging the battery voltage is 2.2 V or less and operation does not start, but operation starts when the voltage increases to 2.2 V or more.
   *** The reset signal is not output when battery voltage increases gradually.**



8.5. Battery Low

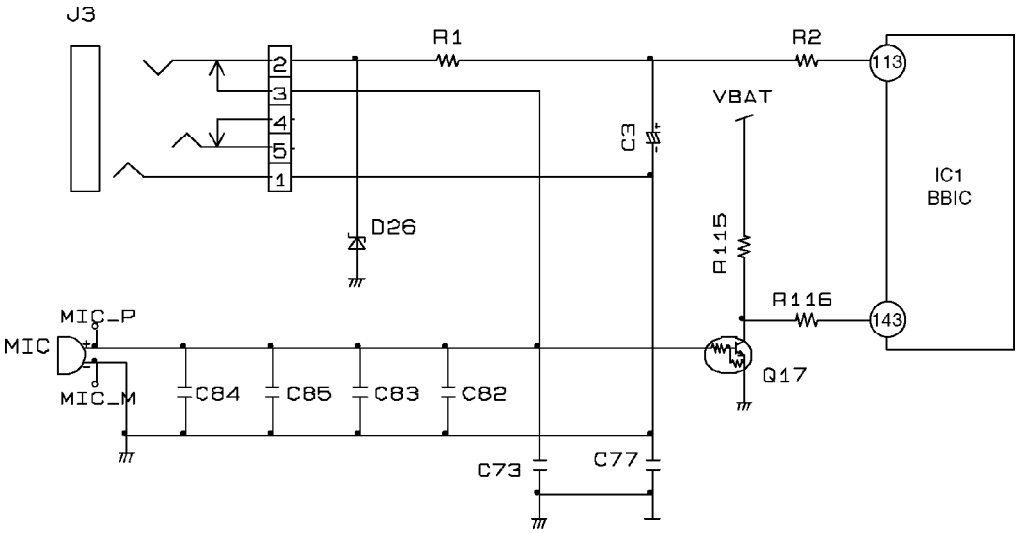
If the battery voltage reaches to about 2.37 V, battery low condition is detected at ADBAT and Battery LOW is displayed.

Power Down Detection and STOP Mode Conditions
When ADBAT detects that the battery voltage is 2.2 V, IC1 switches to STOP mode.



8.6. Headset Detect

The headset detection circuit is shown below. This circuit enables detection of the status of normal cordless handset communication and headset communication, and switching between them.
When the cordless handset is used, MIC bias from pin 133 of IC1 is applied and voltage is applied to MICI by the following route:R2 → R1 → pin 2 of J3 → pin 3 of J3 → MIC_P. This voltage turns Q17 ON so that LOW is input into pin 143 of IC1.hen using the headset, plugging in the headset disconnects pin 2 and pin 3 of J3, resulting in Q17 turning OFF and HIGH being input to pin 143 of IC1. By this method, it can be detected whether or not the headset is present.



8.7. Charge Circuit

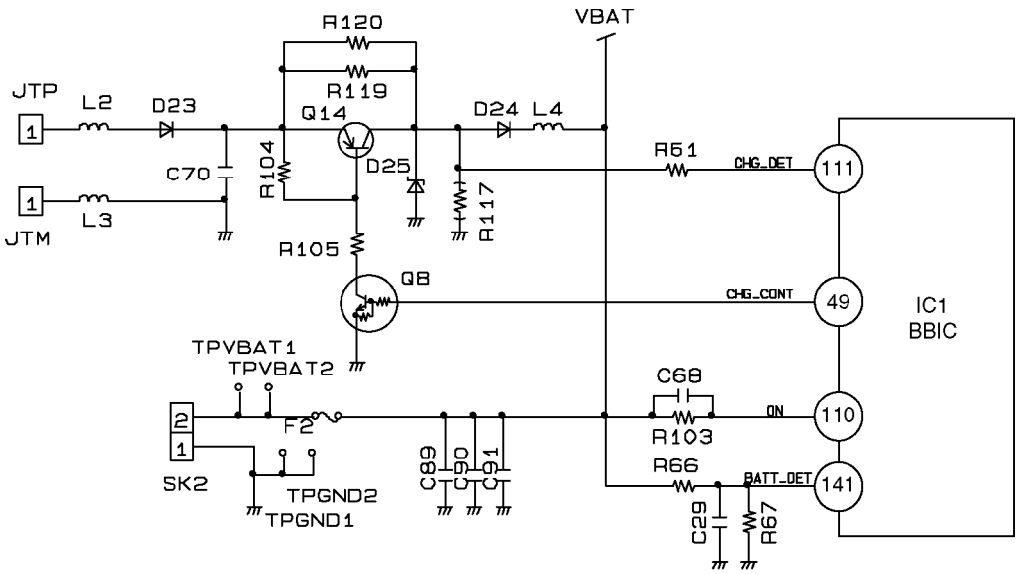
The circuit shown below is used for charge detection, charge control and battery voltage detection.

When charging is performed using the charger, voltage is generated between JTP and JTM, and voltage flows L2 → D23 → R120 and R119 → R61 → pin 111 of IC1, where the charge is detected. Then IC1 calculates the battery consumption amount from the previous charge, and it controls Q8 by pin 49 of IC1 until charging is complete. When charging is complete, charging is switched to trickle charging.

BATT_DET (pin 141 of IC1) monitors the battery voltage and detects BATT LOW at 2.37 V.

Charge current

Q8 OFF: 45mA / Q8 ON: 200mA

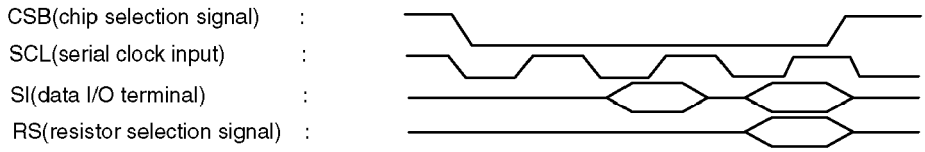


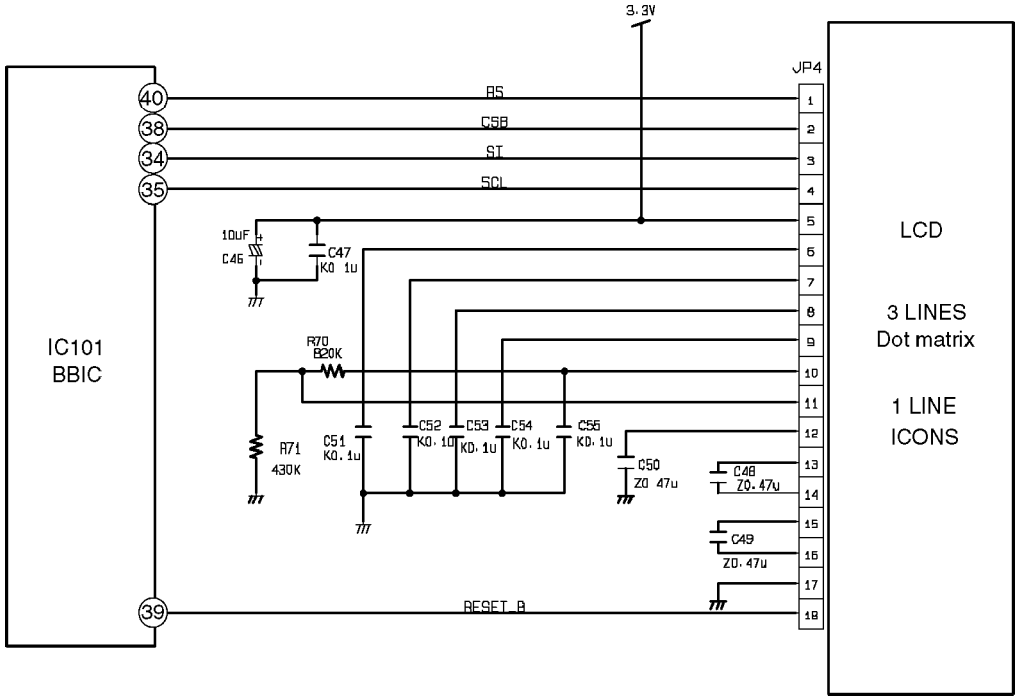
8.8. LCD Circuit

This LCD incorporating a COG IC uses one line for icon display and three lines for character display. / The COG LCD is controlled by 4 control lines (CSB, SCL, SI and RS) from IC1. Power is only supplied by a 2.65 V system. The voltage is up converted inside the LCD and

output at pin 10. This voltage is divided by R70 and R71, and input to pin 11 to set the LCD contrast.

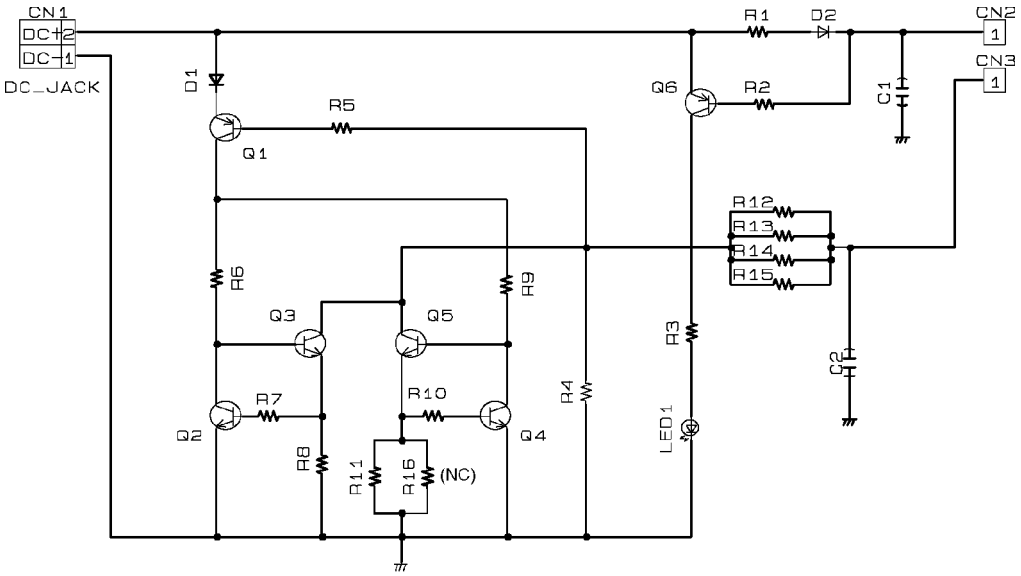
Data Waveform





8.9. Charger

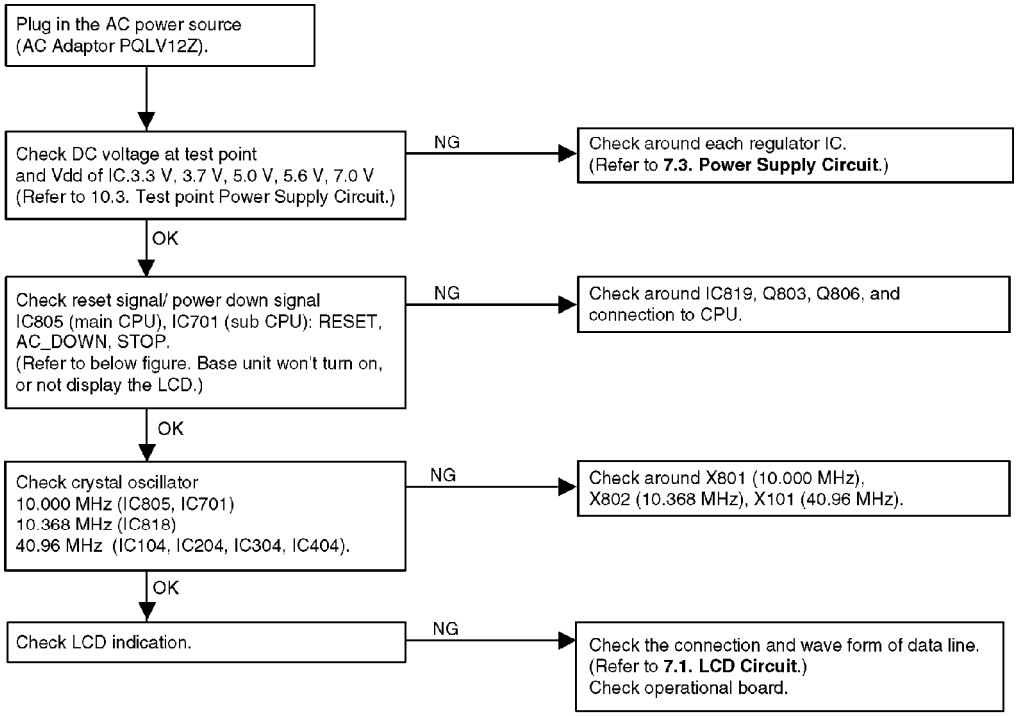
The battery charger circuit for the cordless handset is shown below.
When the cordless handset is placed on the charger, CN2 and CN3 are connected to the charger so the battery is connected. Current then flows to the battery to charge it.
The route for this is as follows: Pin of CN1 → R1 → D2 → CN2 → cordless handset → CN3 → R12 (0 Ω) → Q5 and Q3 → R8 and R11 → pin 1 of CN1.
When cordless handset is charged, Q6 turns ON and LED 1 lights up.Q3, Q2 and Q5, Q4 become fixed current circuits, being divided into 2 circuits in order to reduce the current consumption per circuit.

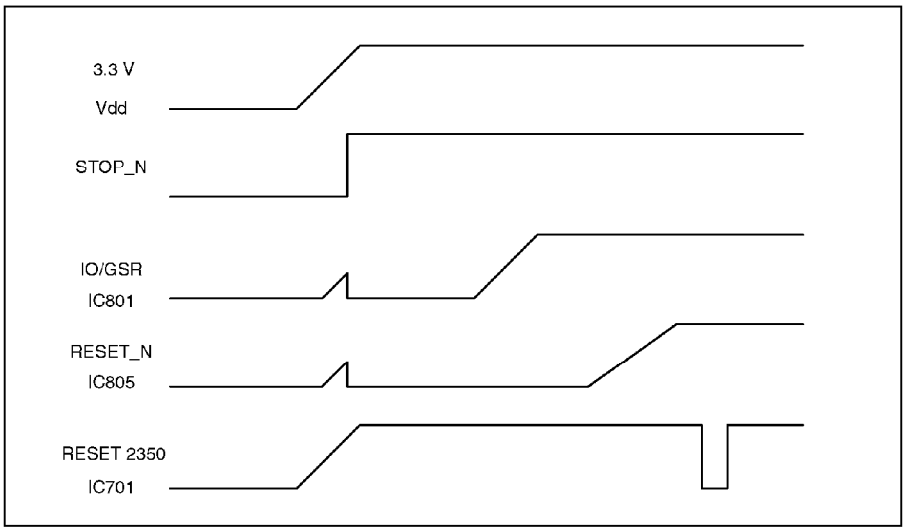


9. TROUBLESHOOTING GUIDE

9.1. Initial Check

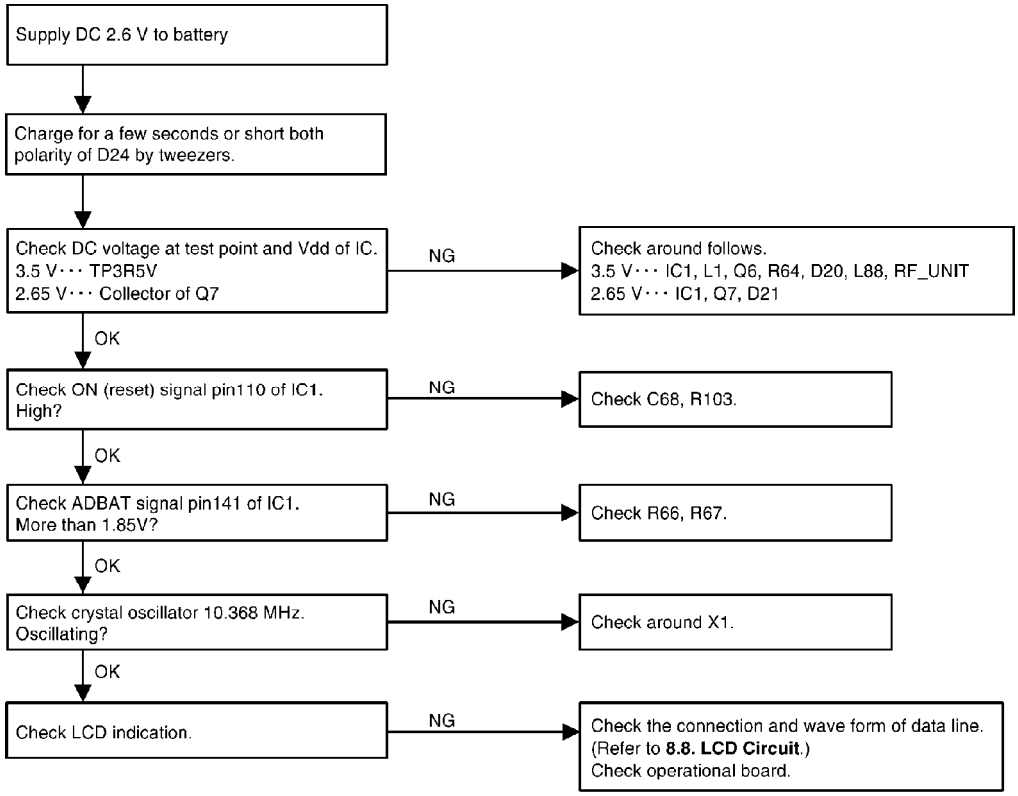
9.1.1. Base unit won’t turn on, or not display the LCD

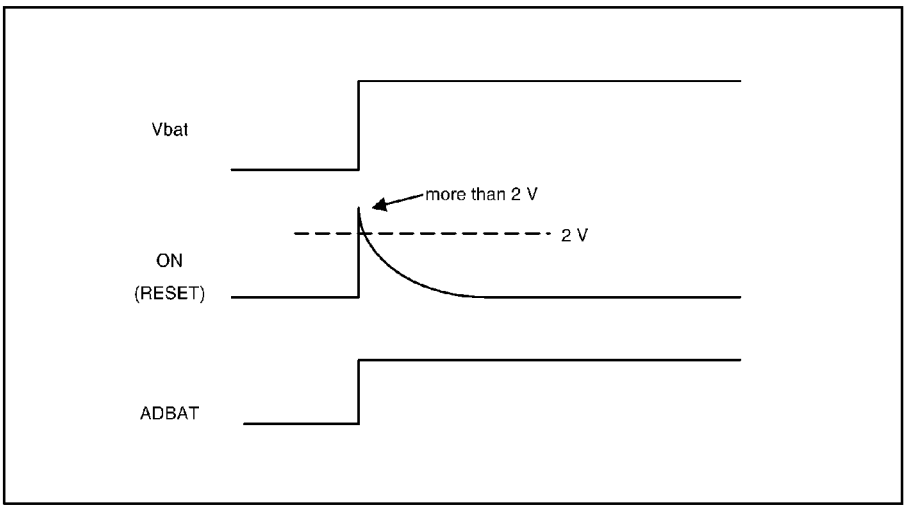

Plug in the AC power source
(AC Adaptor PQLV12Z).
Check DC voltage at test point
and Vdd of IC.3.3 V, 3.7 V, 5.0 V, 5.6 V, 7.0 V
(Refer to 10.3. Test point Power Supply Circuit.)
NG
Check around each regulator IC.
(Refer to 7.3. Power Supply Circuit.)
OK
Check reset signal/ power down signal
IC805 (main CPU), IC701 (sub CPU): RESET,
AC_DOWN, STOP.
(Refer to below figure. Base unit won't turn on,
or not display the LCD.)
NG
Check around IC819, Q803, Q806, and
connection to CPU.
OK
Check crystal oscillator
10.000 MHz (IC805, IC701)
10.368 MHz (IC818)
40.96 MHz (IC104, IC204, IC304, IC404).
NG
Check around X801 (10.000 MHz),
X802 (10.368 MHz), X101 (40.96 MHz).
OK
Check LCD indication.
NG
Check the connection and wave form of data line.
(Refer to 7.1. LCD Circuit.)
Check operational board.



Timing logic of Vdd, RESET, STOP

9.1.2. Cordless handset won't turn on, or not display the LCD





Timing logic of Vbat, ON (RESET), ADBAT

9.1.3. Battery won't charge (Base Unit)

Battery for back-up doesn't charge (Base unit)

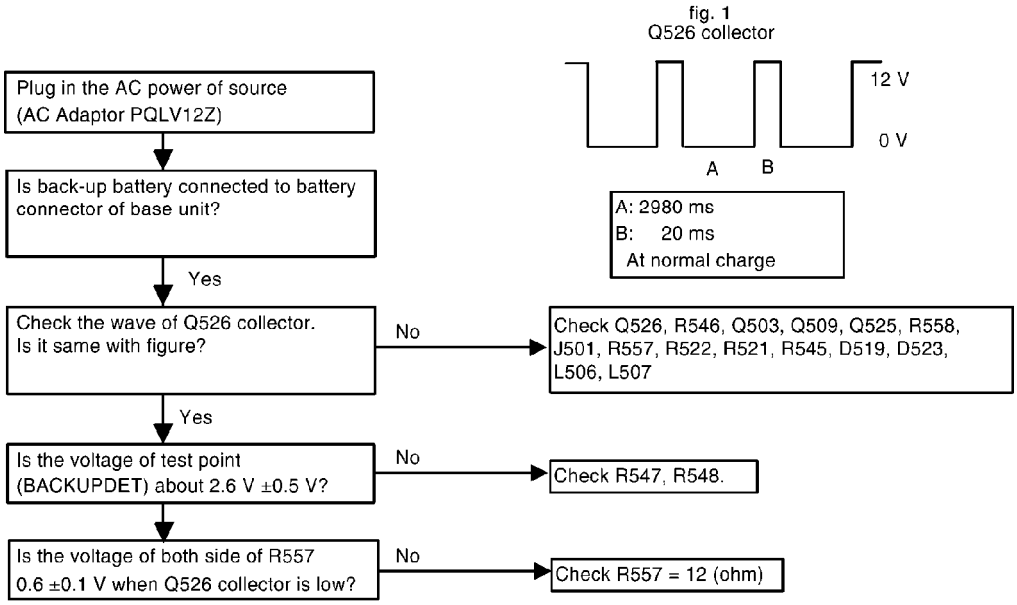
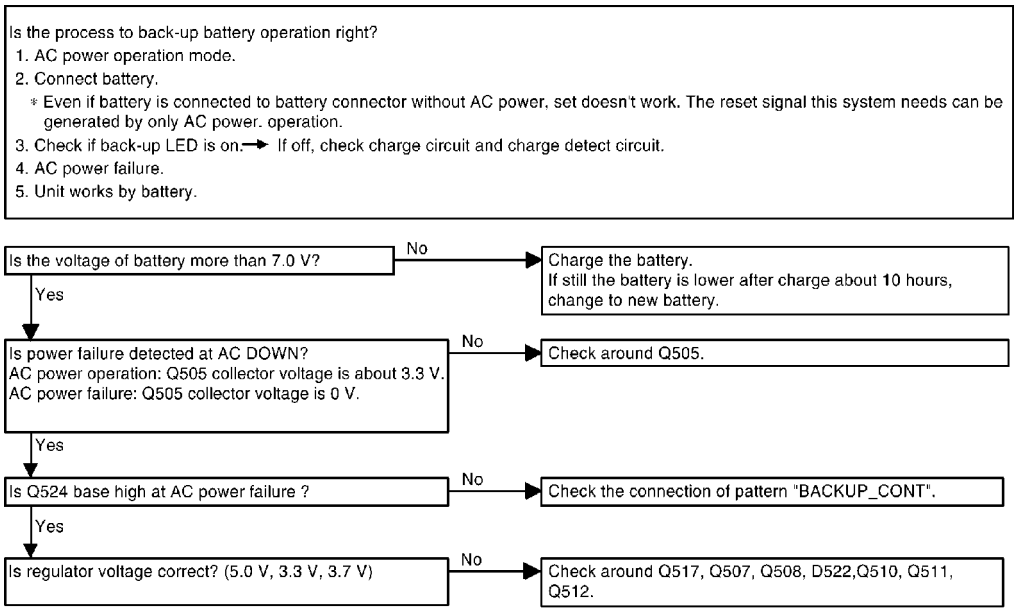


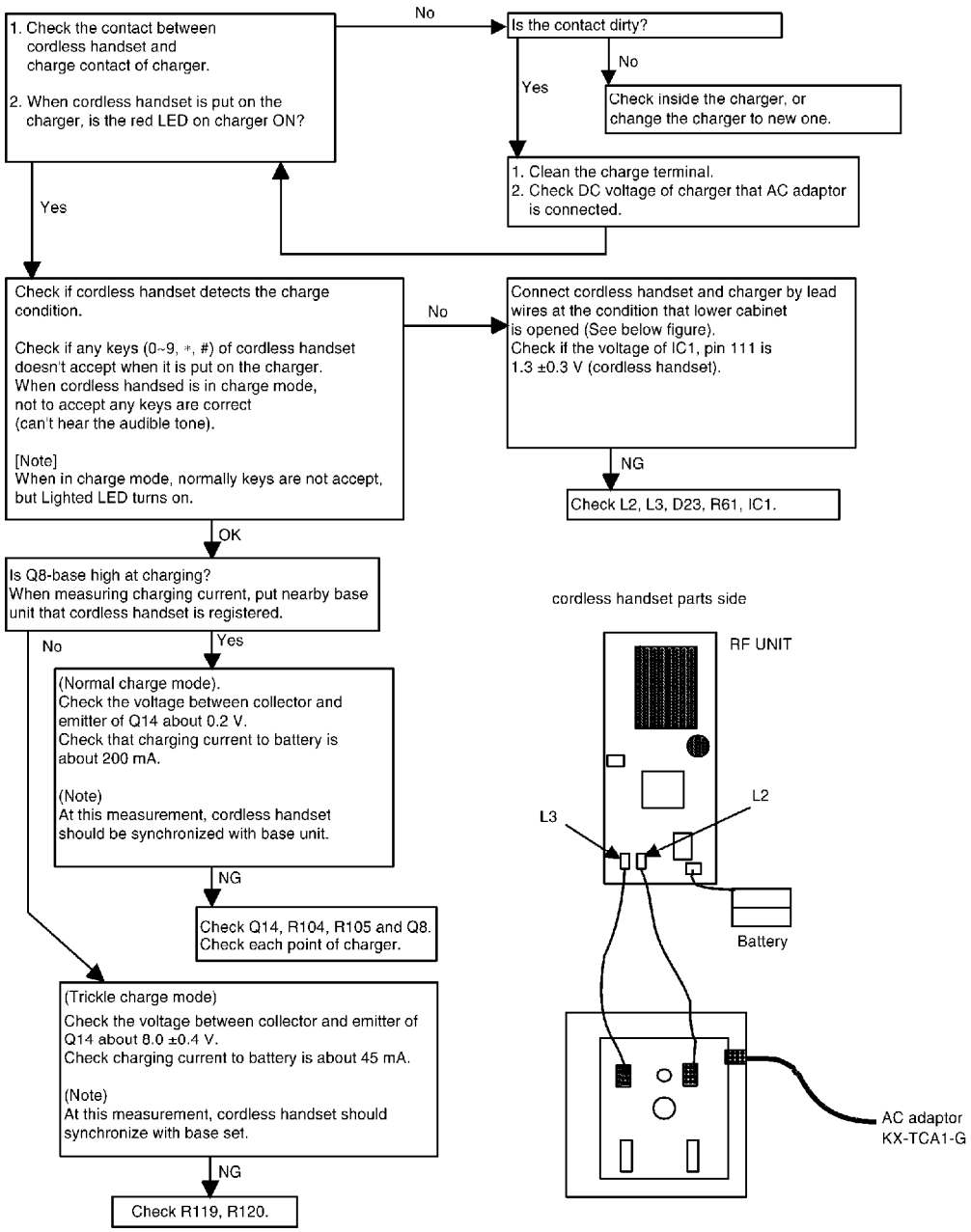
fig. 1
Q526 collector
12 V
0 V
A
B
A: 2980 ms
B: 20 ms
At normal charge
Plug in the AC power of source
(AC Adaptor PQLV12Z)
Is back-up battery connected to battery connector of base unit?
Yes
Check the wave of Q526 collector.
Is it same with figure?
No
Check Q526, R546, Q503, Q509, Q525, R558, J501, R557, R522, R521, R545, D519, D523, L506, L507
Yes
Is the voltage of test point (BACKUPDET) about 2.6 V ±0.5 V?
No
Check R547, R548.
Is the voltage of both side of R557 0.6 ±0.1 V when Q526 collector is low?
No
Check R557 = 12 (ohm)

9.1.4. No work at Power failure

Base unit doesn't work at AC power failure.

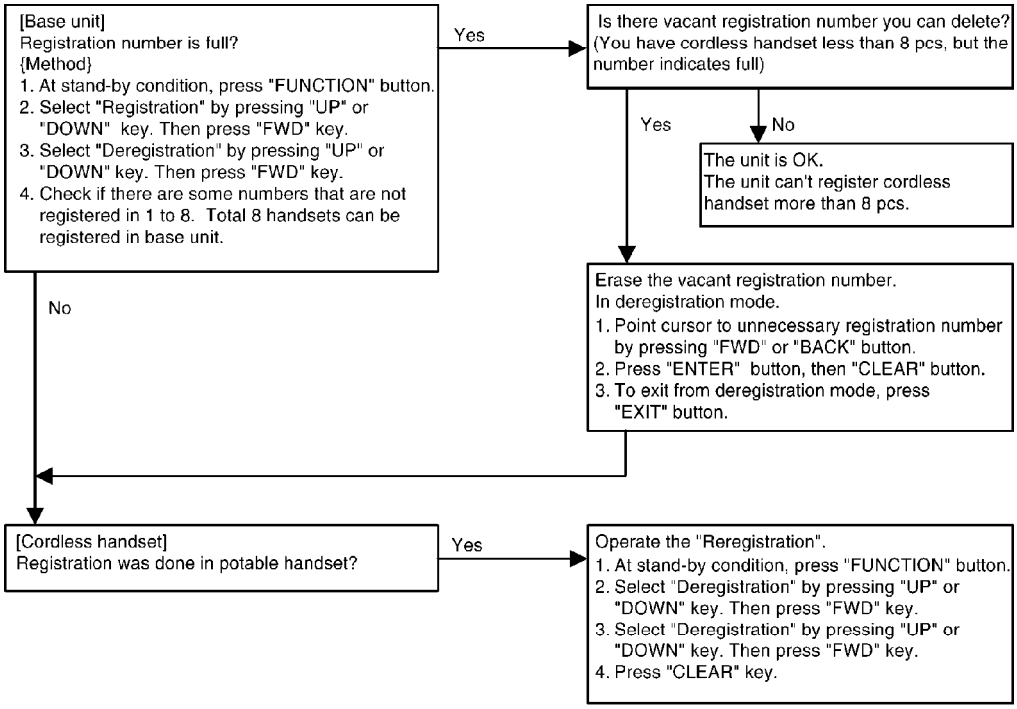

Is the process to back-up battery operation right?
1. AC power operation mode.
2. Connect battery.
* Even if battery is connected to battery connector without AC power, set doesn't work. The reset signal this system needs can be generated by only AC power. operation.
3. Check if back-up LED is on. → If off, check charge circuit and charge detect circuit.
4. AC power failure.
5. Unit works by battery.
Is the voltage of battery more than 7.0 V?
No
Charge the battery.
If still the battery is lower after charge about 10 hours, change to new battery.
Yes
Is power failure detected at AC DOWN?
AC power operation: Q505 collector voltage is about 3.3 V.
AC power failure: Q505 collector voltage is 0 V.
No
Check around Q505.
Yes
Is Q524 base high at AC power failure ?
No
Check the connection of pattern "BACKUP_CONT".
Yes
Is regulator voltage correct? (5.0 V, 3.3 V, 3.7 V)
No
Check around Q517, Q507, Q508, D522,Q510, Q511, Q512.

9.1.5. Battery won’t charge (cordless handset)



9.1.6. Registration can't operate

Check: Can the registration between the base unit and cordless handset be done?


[Base unit]
Registration number is full?
{Method}
1. At stand-by condition, press "FUNCTION" button.
2. Select "Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
3. Select "Deregistration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
4. Check if there are some numbers that are not registered in 1 to 8. Total 8 handsets can be registered in base unit.
Yes
Is there vacant registration number you can delete?
(You have cordless handset less than 8 pcs, but the number indicates full)
Yes
No
The unit is OK.
The unit can't register cordless handset more than 8 pcs.
Erase the vacant registration number.
In deregistration mode.
1. Point cursor to unnecessary registration number by pressing "FWD" or "BACK" button.
2. Press "ENTER" button, then "CLEAR" button.
3. To exit from deregistration mode, press "EXIT" button.
No
[Cordless handset]
Registration was done in potable handset?
Yes
Operate the "Reregistration".
1. At stand-by condition, press "FUNCTION" button.
2. Select "Deregistration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
3. Select "Deregistration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
4. Press "CLEAR" key.

[Registration method]

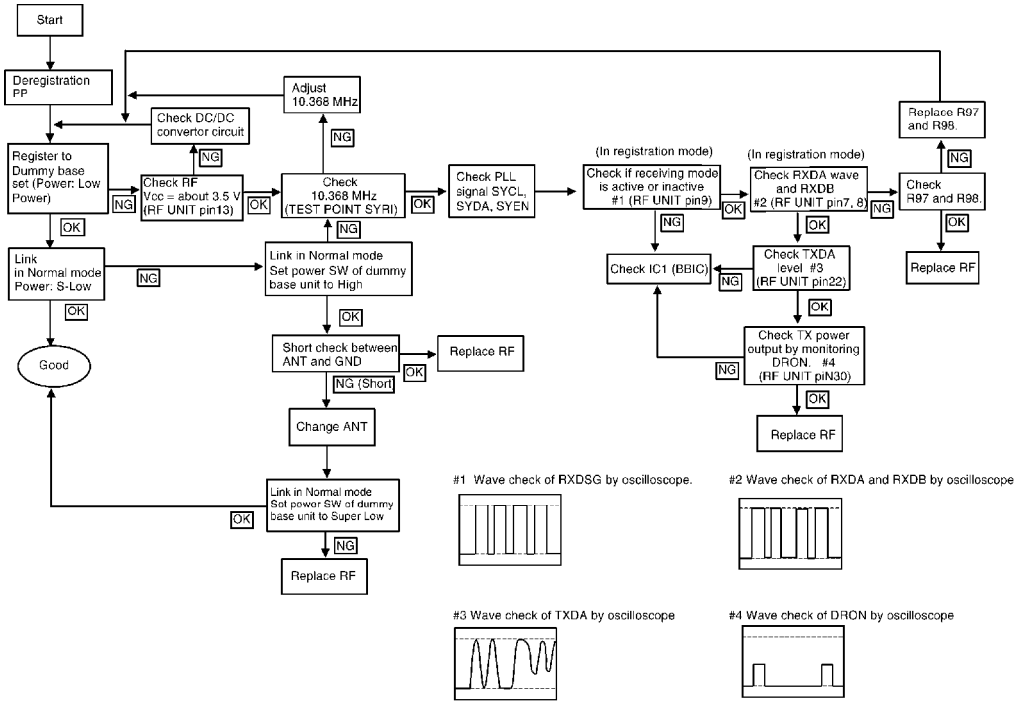
(Base unit)
1. At stand-by condition, press "FUNCTION" button.
2. Select "Registration "by pressing "UP" or "DOWN" key. Then press "FWD" key.
3. Select "HS Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
4. Check the display on LCD is "Handset registering".

(Cordless handset)
On this condition,
1. At stand-by condition, press "FUNCTION" button.
2. Select "Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
3. Select "HS registration" by pressing "UP" or "DOWN" key.
4. If beep of cordless handset sounds, the registration between base unit and cordless handset finishes.
5. To exit registration mode, press "EXIT" key of base unit.

(Note)
This registration should be done within one minute.
If any process are not done in one minute, registration mode is exited.

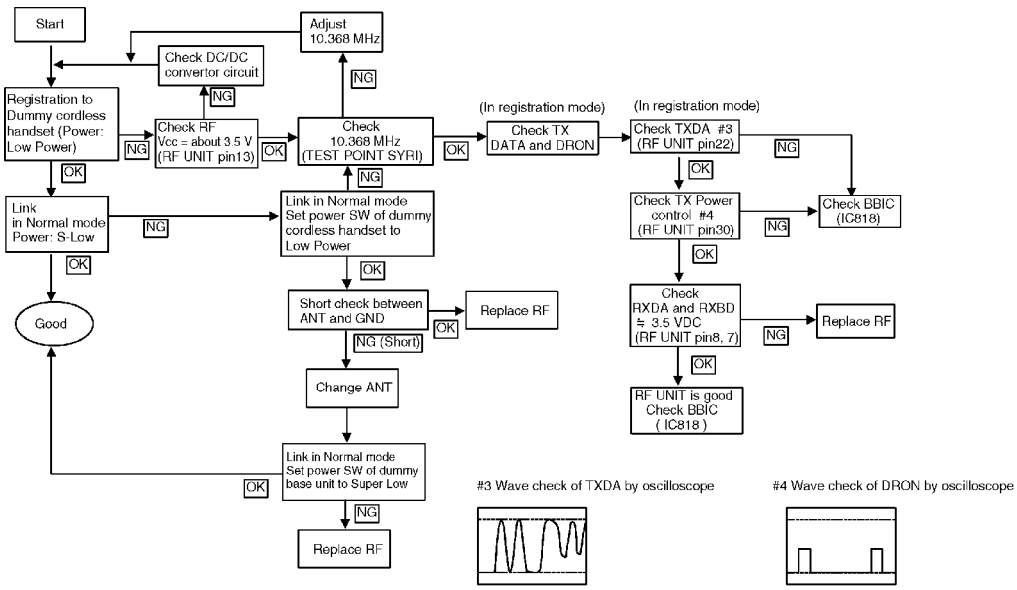
9.2. RF check flowchart for cordless handset

In this flowchart, to check if there is a problem in cordless handset, dummy base unit is used. / Dummy base unit has 2 kinds of TX power level, its level can be changed by power SW. / One is "Low Power", another is "Super Low Power".

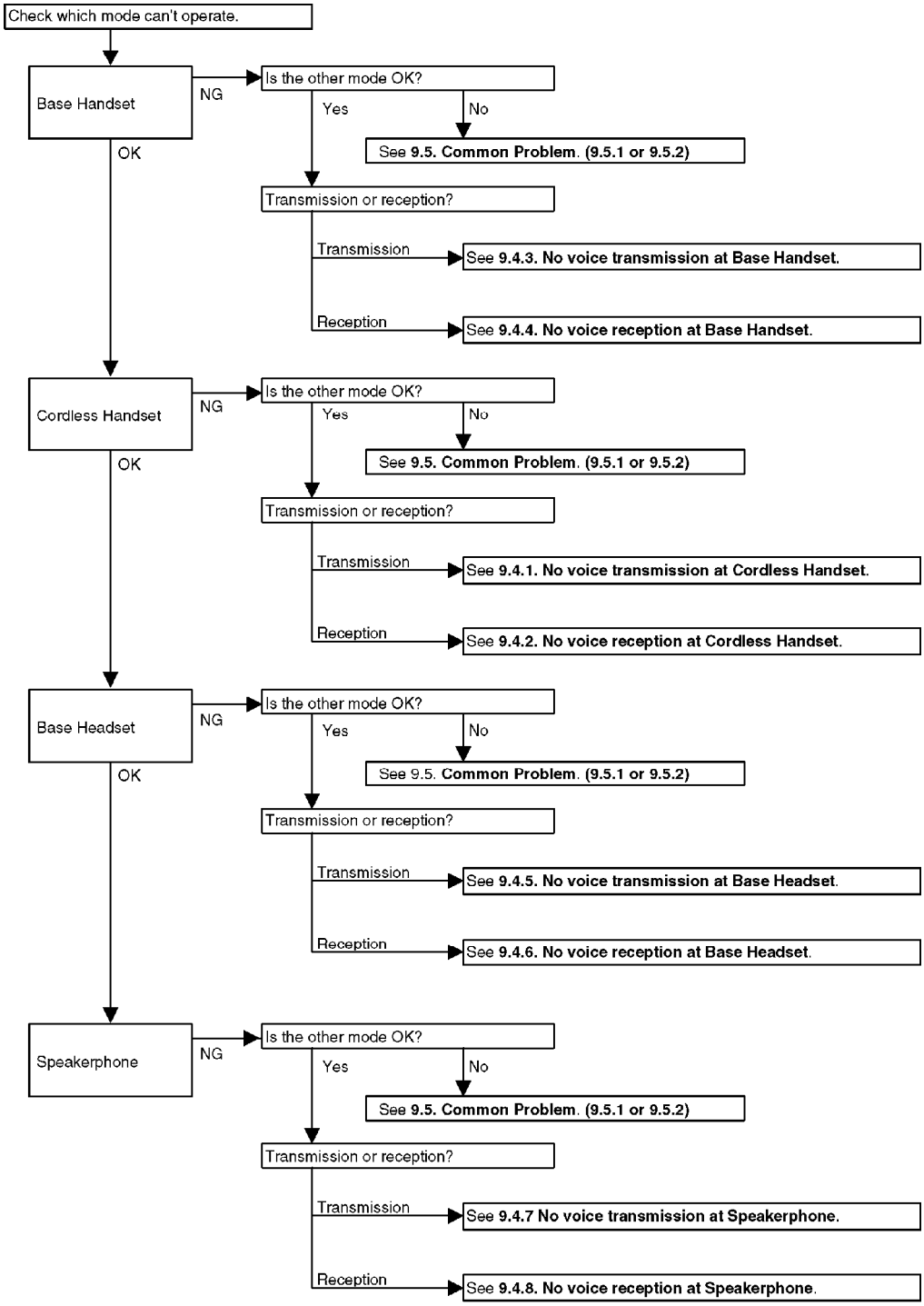


9.3. RF check flowchart for base unit

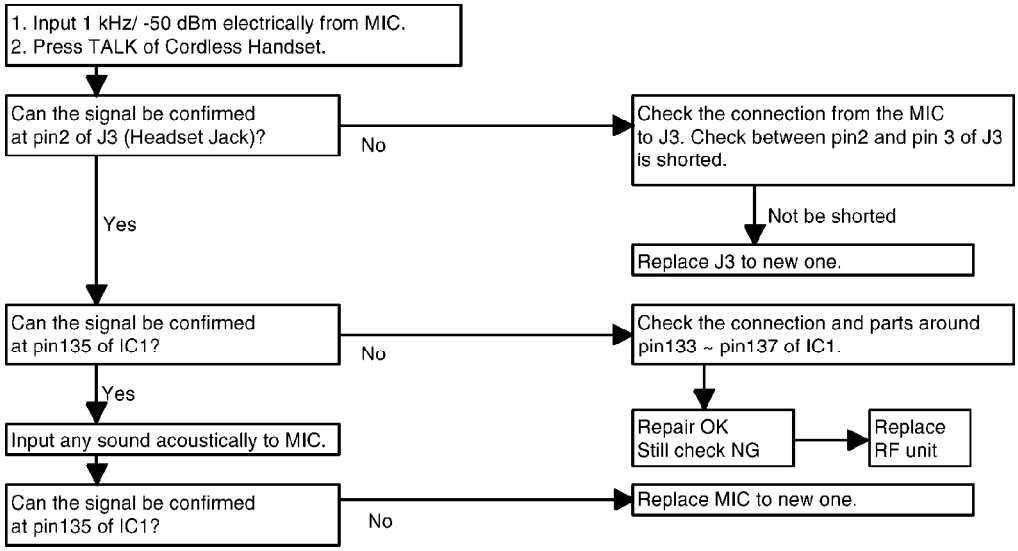
In this flowchart, to check if there is a problem in base unit, dummy base unit is used. / Dummy base set has 2 kinds of TX power level, its level can be changed by power SW. / One is "Low Power", another is "Super Low Power".



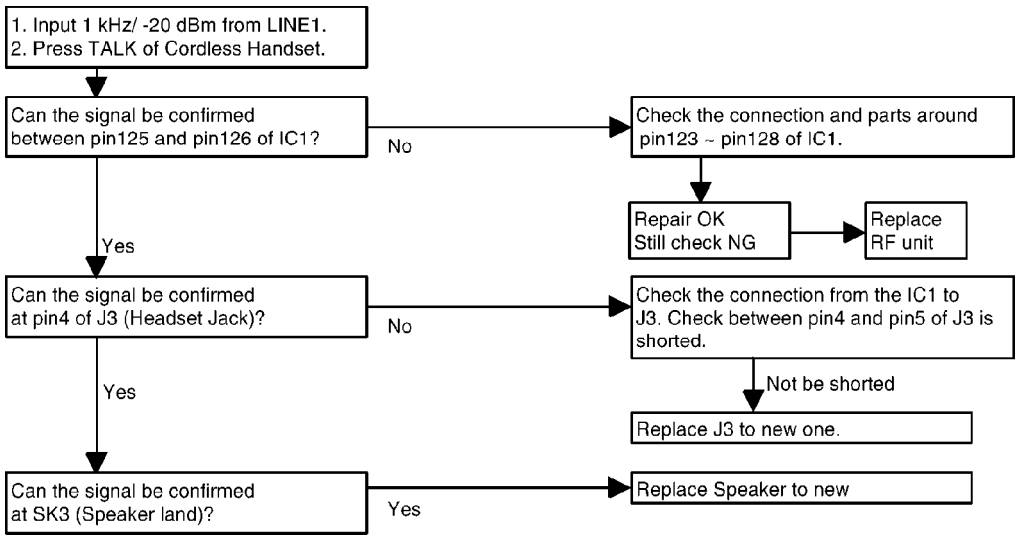
9.4. Problem While Calling



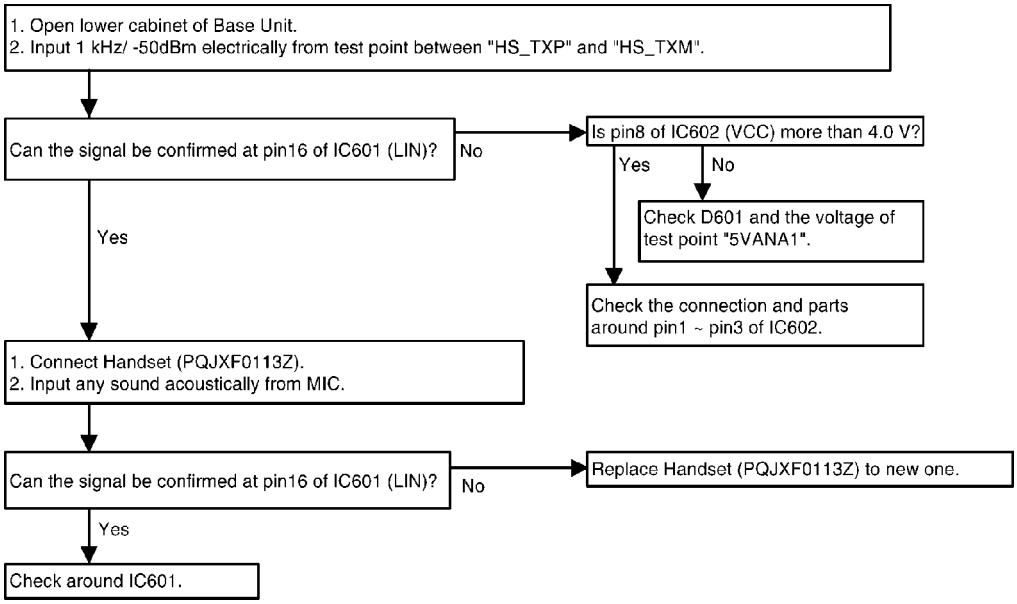
9.4.1. No voice transmission at Cordless Handset


1. Input 1 kHz/ -50 dBm electrically from MIC.
2. Press TALK of Cordless Handset.
Can the signal be confirmed at pin2 of J3 (Headset Jack)?
No
Check the connection from the MIC to J3. Check between pin2 and pin 3 of J3 is shorted.
Not be shorted
Replace J3 to new one.
Yes
Can the signal be confirmed at pin135 of IC1?
No
Check the connection and parts around pin133 ~ pin137 of IC1.
Repair OK Still check NG
Replace RF unit
Yes
Input any sound acoustically to MIC.
Can the signal be confirmed at pin135 of IC1?
No
Replace MIC to new one.

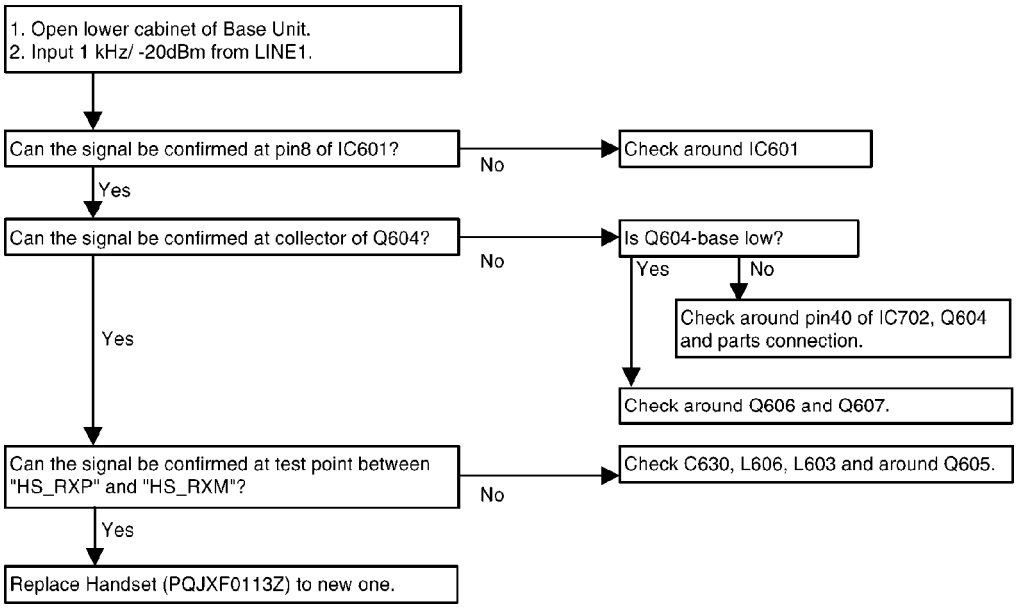
9.4.2. No voice reception at Cordless Handset


1. Input 1 kHz/ -20 dBm from LINE1.
2. Press TALK of Cordless Handset.
Can the signal be confirmed between pin125 and pin126 of IC1?
No
Check the connection and parts around pin123 ~ pin128 of IC1.
Repair OK Still check NG
Replace RF unit
Yes
Can the signal be confirmed at pin4 of J3 (Headset Jack)?
No
Check the connection from the IC1 to J3. Check between pin4 and pin5 of J3 is shorted.
Not be shorted
Replace J3 to new one.
Yes
Can the signal be confirmed at SK3 (Speaker land)?
Yes
Replace Speaker to new

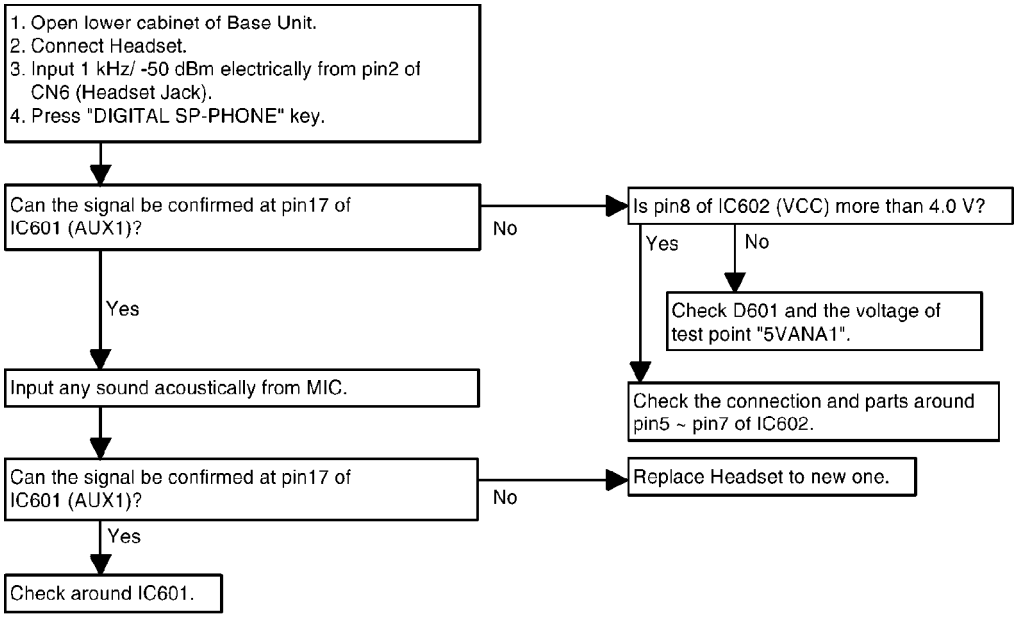
9.4.3. No voice transmission at Base Handset


1. Open lower cabinet of Base Unit.
2. Input 1 kHz/ -50dBm electrically from test point between "HS_TXP" and "HS_TXM".
Can the signal be confirmed at pin16 of IC601 (LIN)?
No
Is pin8 of IC602 (VCC) more than 4.0 V?
Yes
No
Check D601 and the voltage of test point "5VANA1".
Check the connection and parts around pin1 ~ pin3 of IC602.
Yes
1. Connect Handset (PQJXF0113Z).
2. Input any sound acoustically from MIC.
Can the signal be confirmed at pin16 of IC601 (LIN)?
No
Replace Handset (PQJXF0113Z) to new one.
Yes
Check around IC601.

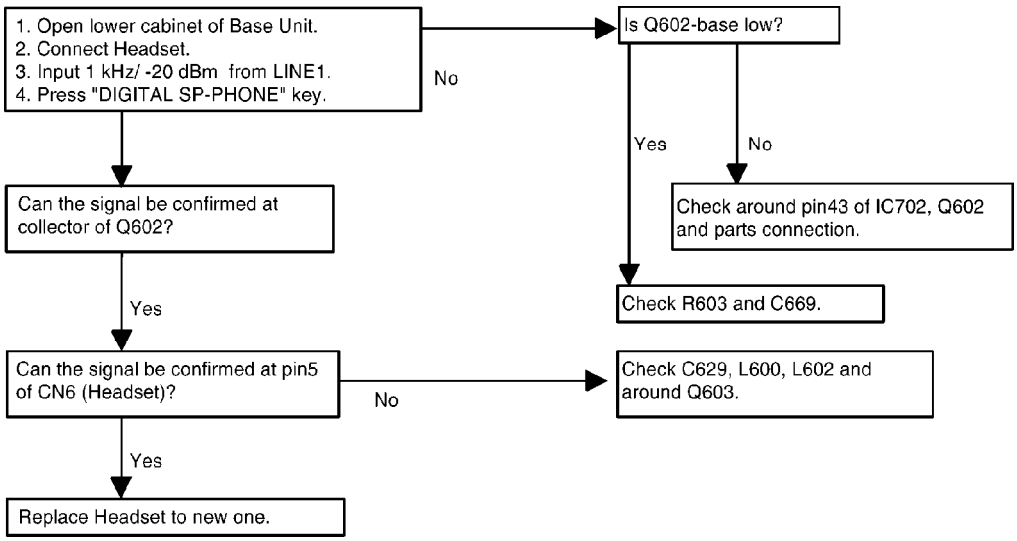
9.4.4. No voice reception at Base Handset


1. Open lower cabinet of Base Unit.
2. Input 1 kHz/ -20dBm from LINE1.
Can the signal be confirmed at pin8 of IC601?
No
Check around IC601
Yes
Can the signal be confirmed at collector of Q604?
No
Is Q604-base low?
Yes
No
Check around pin40 of IC702, Q604 and parts connection.
Yes
Check around Q606 and Q607.
Can the signal be confirmed at test point between "HS_RXP" and "HS_RXM"?
No
Check C630, L606, L603 and around Q605.
Yes
Replace Handset (PQJXF0113Z) to new one.

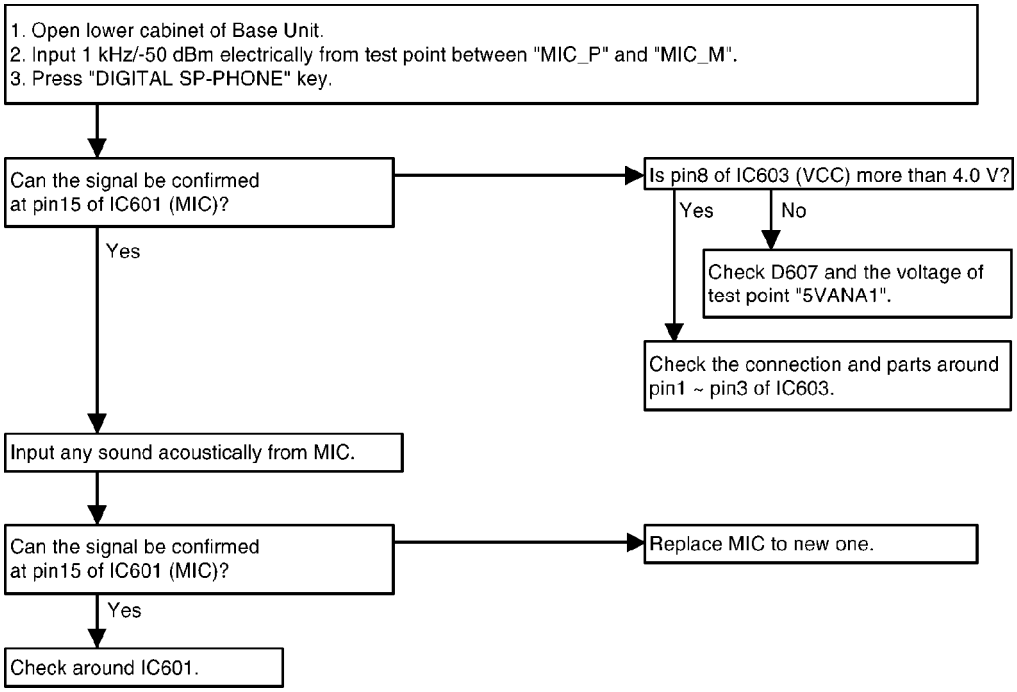
9.4.5. No voice transmission at Base Headset


1. Open lower cabinet of Base Unit.
2. Connect Headset.
3. Input 1 kHz/ -50 dBm electrically from pin2 of CN6 (Headset Jack).
4. Press "DIGITAL SP-PHONE" key.
Can the signal be confirmed at pin17 of IC601 (AUX1)?
No
Is pin8 of IC602 (VCC) more than 4.0 V?
Yes
No
Check D601 and the voltage of test point "5VANA1".
Yes
Input any sound acoustically from MIC.
Check the connection and parts around pin5 ~ pin7 of IC602.
Can the signal be confirmed at pin17 of IC601 (AUX1)?
No
Replace Headset to new one.
Yes
Check around IC601.

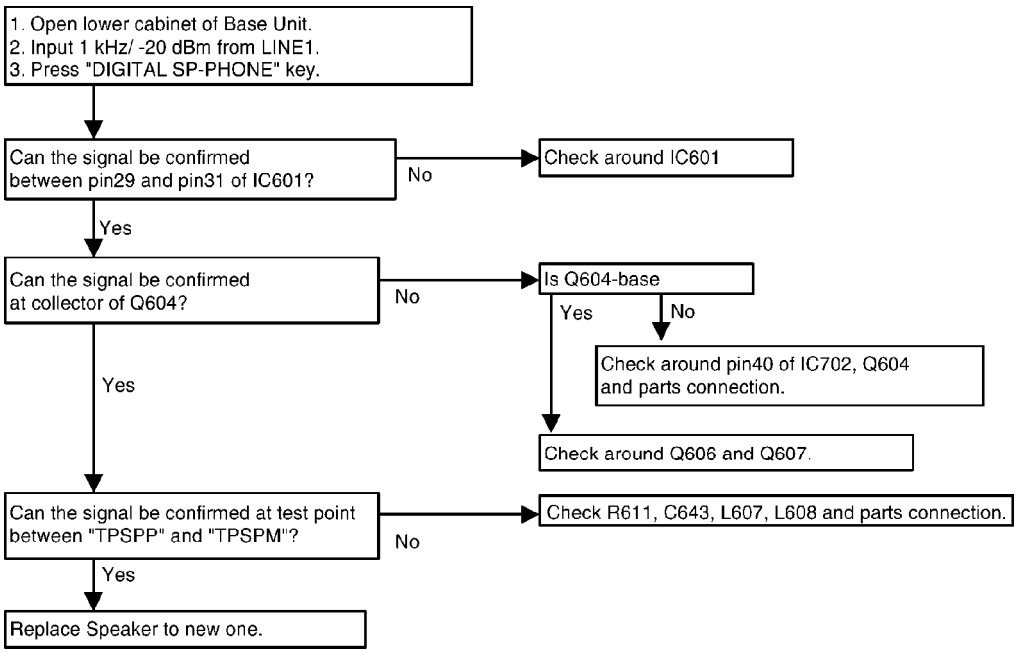
9.4.6. No voice reception at Base Headset


1. Open lower cabinet of Base Unit.
2. Connect Headset.
3. Input 1 kHz/ -20 dBm from LINE1.
4. Press "DIGITAL SP-PHONE" key.
No
Is Q602-base low?
Yes
No
Check around pin43 of IC702, Q602 and parts connection.
Can the signal be confirmed at collector of Q602?
Yes
Check R603 and C669.
Can the signal be confirmed at pin5 of CN6 (Headset)?
No
Check C629, L600, L602 and around Q603.
Yes
Replace Headset to new one.

9.4.7. No voice transmission at Speakerphone

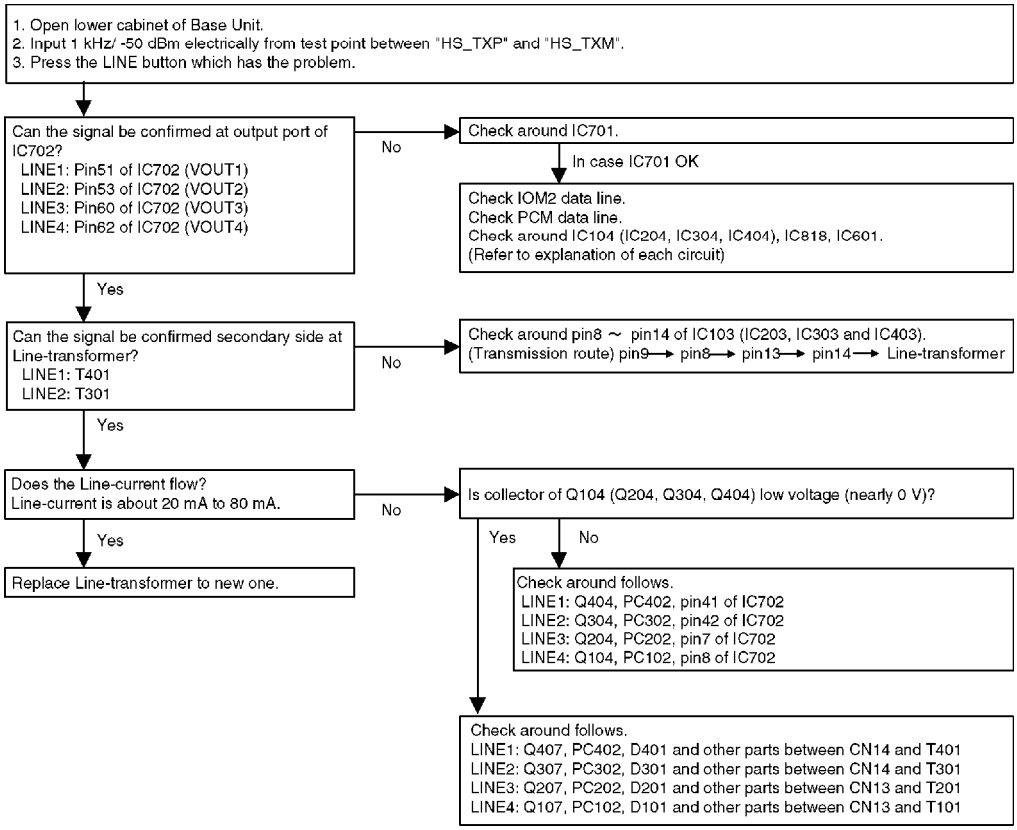

1. Open lower cabinet of Base Unit.
2. Input 1 kHz/-50 dBm electrically from test point between "MIC_P" and "MIC_M".
3. Press "DIGITAL SP-PHONE" key.
Can the signal be confirmed at pin15 of IC601 (MIC)?
Is pin8 of IC603 (VCC) more than 4.0 V?
Yes
No
Check D607 and the voltage of test point "5VANA1".
Check the connection and parts around pin1 ~ pin3 of IC603.
Yes
Input any sound acoustically from MIC.
Can the signal be confirmed at pin15 of IC601 (MIC)?
Replace MIC to new one.
Yes
Check around IC601.

9.4.8. No voice reception at Speakerphone

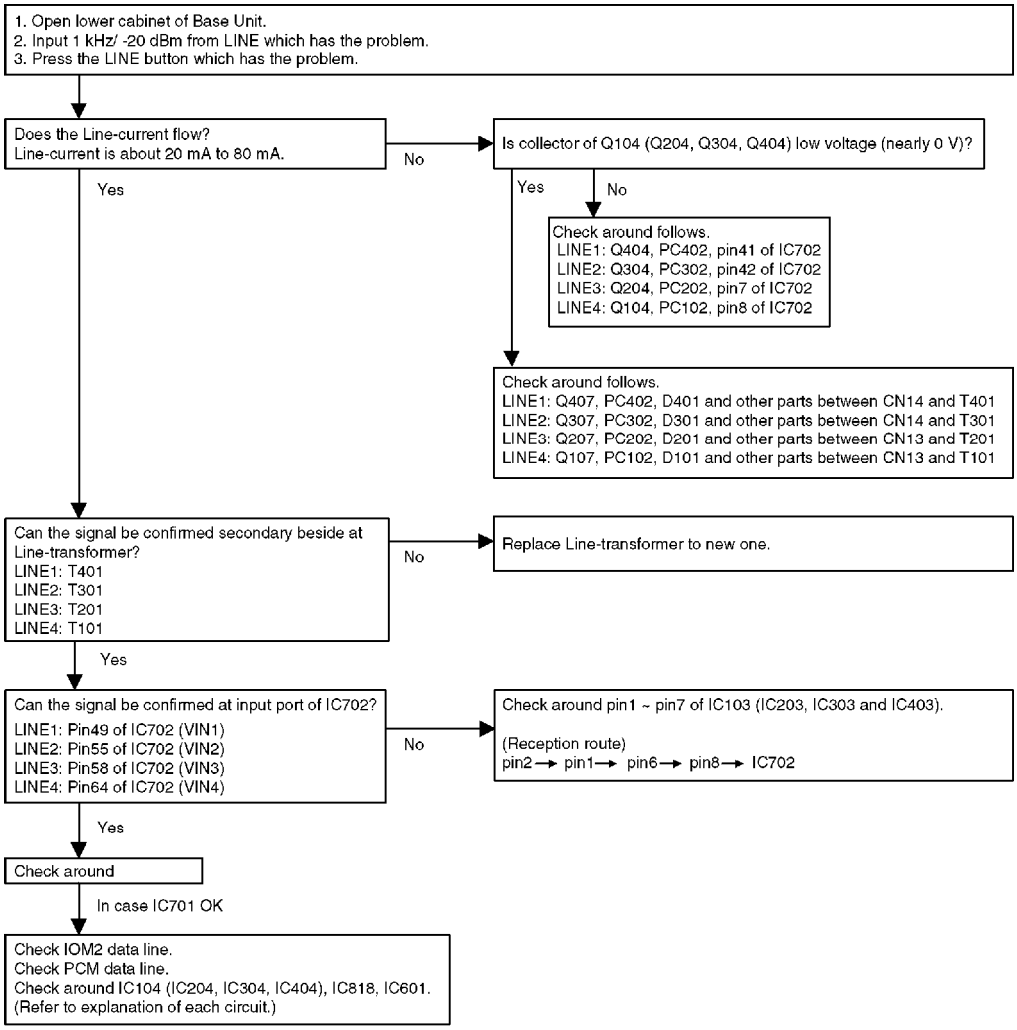

1. Open lower cabinet of Base Unit.
2. Input 1 kHz/ -20 dBm from LINE1.
3. Press "DIGITAL SP-PHONE" key.
Can the signal be confirmed between pin29 and pin31 of IC601?
No
Check around IC601
Yes
Can the signal be confirmed at collector of Q604?
No
Is Q604-base
Yes
No
Check around pin40 of IC702, Q604 and parts connection.
Yes
Check around Q606 and Q607.
Can the signal be confirmed at test point between "TPSPP" and "TPSPM"?
No
Check R611, C643, L607, L608 and parts connection.
Yes
Replace Speaker to new one.

9.5. Common Problem

9.5.1. No voice transmission at any mode

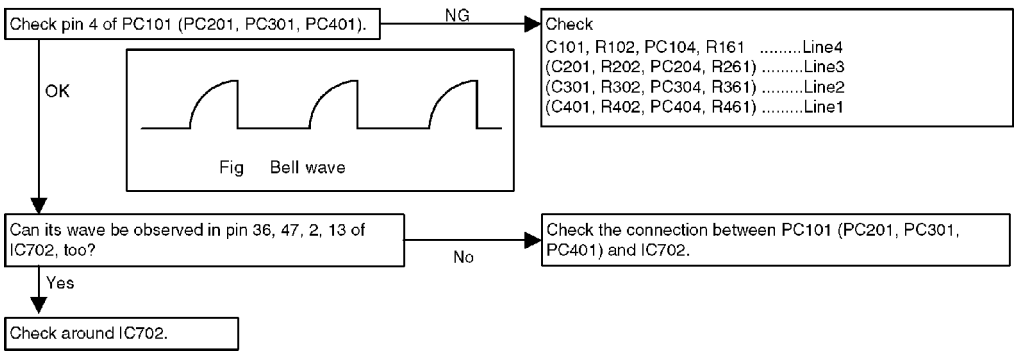

1. Open lower cabinet of Base Unit.
2. Input 1 kHz/ -50 dBm electrically from test point between "HS_TXP" and "HS_TXM".
3. Press the LINE button which has the problem.
Can the signal be confirmed at output port of IC702?
LINE1: Pin51 of IC702 (VOUT1)
LINE2: Pin53 of IC702 (VOUT2)
LINE3: Pin60 of IC702 (VOUT3)
LINE4: Pin62 of IC702 (VOUT4)
No
Check around IC701.
In case IC701 OK
Check IOM2 data line.
Check PCM data line.
Check around IC104 (IC204, IC304, IC404), IC818, IC601.
(Refer to explanation of each circuit)
Yes
Can the signal be confirmed secondary side at Line-transformer?
LINE1: T401
LINE2: T301
No
Check around pin8 ~ pin14 of IC103 (IC203, IC303 and IC403).
(Transmission route) pin9 → pin8 → pin13 → pin14 → Line-transformer
Yes
Does the Line-current flow?
Line-current is about 20 mA to 80 mA.
No
Is collector of Q104 (Q204, Q304, Q404) low voltage (nearly 0 V)?
Yes
Yes
No
Replace Line-transformer to new one.
Check around follows.
LINE1: Q404, PC402, pin41 of IC702
LINE2: Q304, PC302, pin42 of IC702
LINE3: Q204, PC202, pin7 of IC702
LINE4: Q104, PC102, pin8 of IC702
Check around follows.
LINE1: Q407, PC402, D401 and other parts between CN14 and T401
LINE2: Q307, PC302, D301 and other parts between CN14 and T301
LINE3: Q207, PC202, D201 and other parts between CN13 and T201
LINE4: Q107, PC102, D101 and other parts between CN13 and T101

9.5.2. No voice reception at any mode

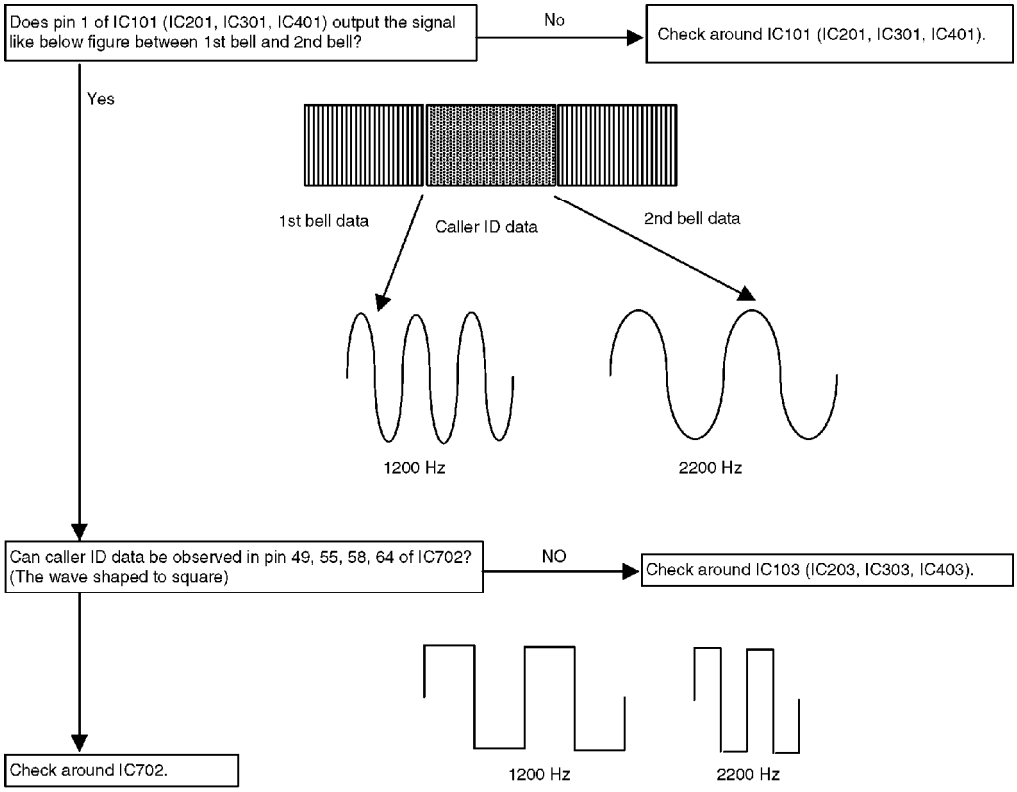

1. Open lower cabinet of Base Unit.
2. Input 1 kHz/ -20 dBm from LINE which has the problem.
3. Press the LINE button which has the problem.
Does the Line-current flow?
Line-current is about 20 mA to 80 mA.
No
Is collector of Q104 (Q204, Q304, Q404) low voltage (nearly 0 V)?
Yes
No
Yes
Check around follows.
LINE1: Q404, PC402, pin41 of IC702
LINE2: Q304, PC302, pin42 of IC702
LINE3: Q204, PC202, pin7 of IC702
LINE4: Q104, PC102, pin8 of IC702
Check around follows.
LINE1: Q407, PC402, D401 and other parts between CN14 and T401
LINE2: Q307, PC302, D301 and other parts between CN14 and T301
LINE3: Q207, PC202, D201 and other parts between CN13 and T201
LINE4: Q107, PC102, D101 and other parts between CN13 and T101
Can the signal be confirmed secondary beside at Line-transformer?
LINE1: T401
LINE2: T301
LINE3: T201
LINE4: T101
No
Replace Line-transformer to new one.
Yes
Can the signal be confirmed at input port of IC702?
LINE1: Pin49 of IC702 (VIN1)
LINE2: Pin55 of IC702 (VIN2)
LINE3: Pin58 of IC702 (VIN3)
LINE4: Pin64 of IC702 (VIN4)
No
Check around pin1 ~ pin7 of IC103 (IC203, IC303 and IC403).
(Reception route)
pin2 → pin1 → pin6 → pin8 → IC702
Yes
Check around
In case IC701 OK
Check IOM2 data line.
Check PCM data line.
Check around IC104 (IC204, IC304, IC404), IC818, IC601.
(Refer to explanation of each circuit.)

9.6. Bell and Call ID Problem

9.6.1. Bell can not be detected


Check pin 4 of PC101 (PC201, PC301, PC401).
NG
Check
C101, R102, PC104, R161 .....Line4
(C201, R202, PC204, R261) Line3
(C301, R302, PC304, R361) Line2
(C401, R402, PC404, R461) Line1
OK
Fig Bell wave
Can its wave be observed in pin 36, 47, 2, 13 of IC702, too?
No
Check the connection between PC101 (PC201, PC301, PC401) and IC702.
Yes
Check around IC702.

9.6.2. Call ID can not be detected


Does pin 1 of IC101 (IC201, IC301, IC401) output the signal like below figure between 1st bell and 2nd bell?
No
Check around IC101 (IC201, IC301, IC401).
Yes
1st bell data
Caller ID data
2nd bell data
1200 Hz
2200 Hz
Can caller ID data be observed in pin 49, 55, 58, 64 of IC702? (The wave shaped to square)
NO
Check around IC103 (IC203, IC303, IC403).
Check around IC702.
1200 Hz
2200 Hz

9.7. Error Message When The Power Supply

If the Base unit has problems when the power supply, Error Message is indicated to LCD. / Message is indicated as follows.

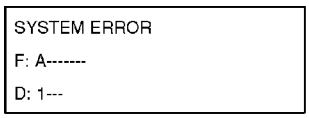


Fig Ex. 1

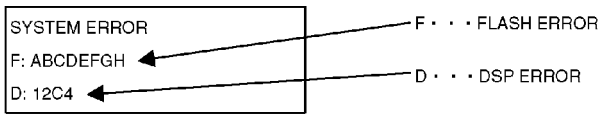


Fig Ex. 2

F・・・FLASH ERROR (IC705)

If an area of FLASH ROM (IC705) is missing or having some problems, LCD indicates this error.
The error is possible to indicate from "A" to "H", all indication mean Memory destruction of FLASH ROM.
If this error indicates, change FLASH ROM to new one installed initial data.

D・・・DSP ERROR (IC104, IC204, IC304, IC404)

If a DSP does not answer, or an answer is wrong, LCD indicates this error. Meaning of Error message is follows.

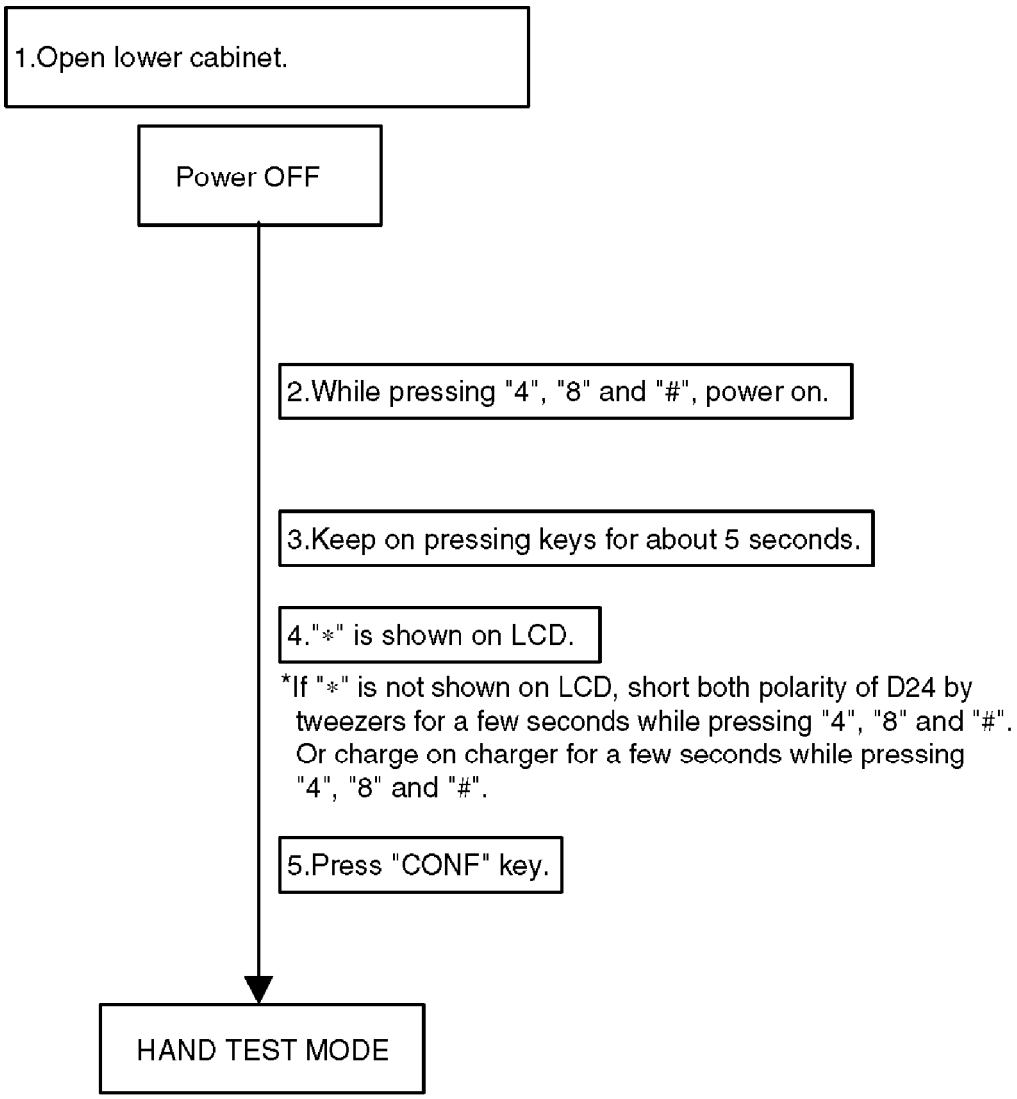
"1"・・・IC104 does not answer.
"2"・・・IC204 does not answer.
"3"・・・IC304 does not answer.
"4"・・・IC404 does not answer.
"A"・・・IC104 can answer, but data is wrong.
"B"・・・IC204 can answer, but data is wrong.
"C"・・・IC304 can answer, but data is wrong.
"D"・・・IC404 can answer, but data is wrong.

If this error indicates, Check the connection between IC701 (Sub CPU) and each DSP.

10. TEST MODE

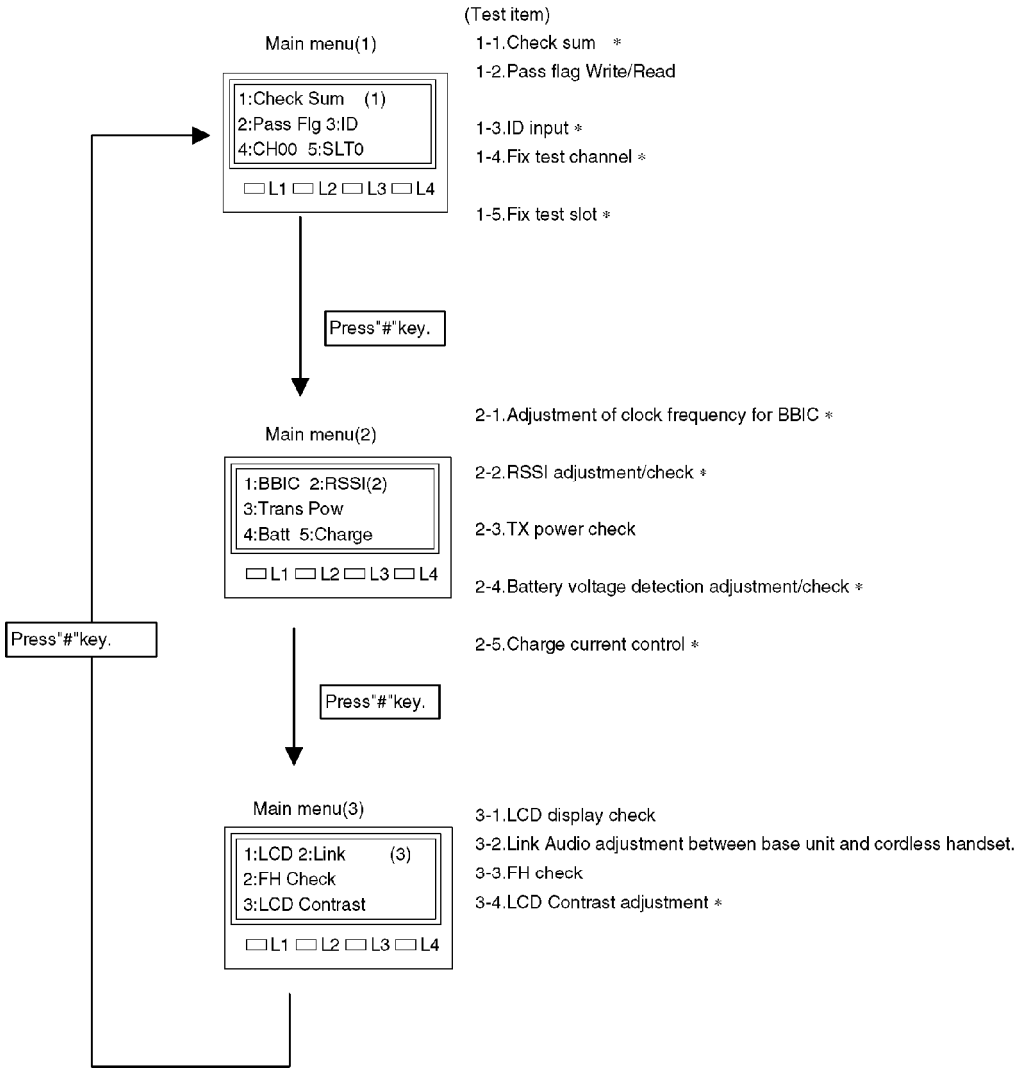
10.1. Test Mode Flow Chart for Maintenance of the Cordless Handset

Power supply: DC 2.6 V

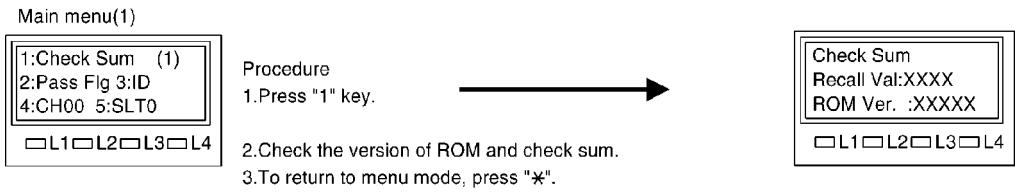

1.Open lower cabinet.
Power OFF
2.While pressing "4", "8" and "#", power on.
3.Keep on pressing keys for about 5 seconds.
4."∗" is shown on LCD.
*If "∗" is not shown on LCD, short both polarity of D24 by tweezers for a few seconds while pressing "4", "8" and "#". Or charge on charger for a few seconds while pressing "4", "8" and "#".
5.Press "CONF" key.
HAND TEST MODE
Main menu(1)

10.1.1. Test Mode Setting Method 2

The explanation of transition between the hand test mode condition and the each mode. Items with "*" is used for maintenance.

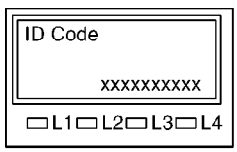


10.1.2. Check Sum



2.Check the version of ROM and check sum.
3.To return to menu mode, press "*".
*This select mode is used when checking version of ROM that is used in cordless handset is correct. This check sum means the sum of binary data in IC3.

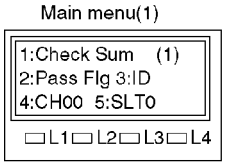
10.1.3. ID Check/Write



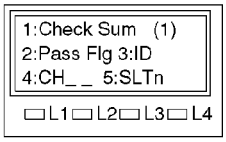
ID check/write mode

This data should not be written in normal repairing process. Only when EEPROM(IC4) is exchanged to new one,same ID should be written in below process.
1.Press"3" key.→Current ID data is displayed. (In case of new EEPROM, all "F" is displayed.)
2.Enter the same ID number of last EEPROM in 10digits of hexadecimal. See table A for hexadecimal table.
3.To write it to EEPROM, press "#" key.
4.To exit ID check/write mode, press "*" key.

10.1.4. Fix Test Channel



Procedure
1.Press "4" key.

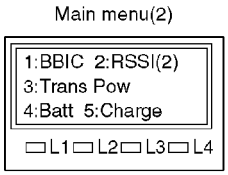


2.Input the channnel to be used in number of two digits. (00 ~ 93)

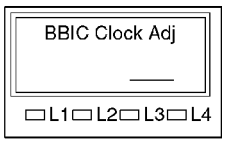
3.Set the channel to be inputted by pressing "#".

*This select mode is used when changing channel. Normally use 00ch.
If you don't select "4", channel 00 is used.

10.1.5. Clock Adjustment

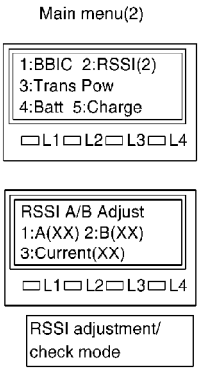


Procedure
1.Press "1" key.



2.Enter Frequency code of 4 digits in hexadecimal number.
See the process to adjust frequency .
3.Set the clock frequency by pressing "#".
By pressing "#", updated data is recorded on EEPROM.
4.Return to main menu(2) by pressing "*" key.
*This select mode is used when calibrating clock frequency (10.368MHz).
Accuracy of clock frequency is important.

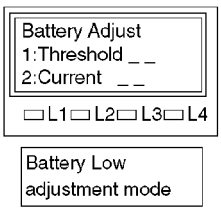
10.1.6. RSSI Adjustment/Confirmation



To enter this mode, cordless handset and base unit should be in test mode link.
At the test link condition,to return menu mode, press "*". Mode changes to menu(3). To return menu(2), press "*" key or press "#" key twice.
Procedure
1.Press "2" key. Display changes to "RSSI adjustment/check mode".
RSSI A and RSSI B are registered and current RSSI value are displayed.
2.To adjust RSSI A, put dummy base unit on the right position of cordless handset.
Set dummy base unit condition to Super Low Power. Then press "1" key.
RSSI A is registered.
3.To adjust RSSI B, put dummy base unit on the right position of cordless handset.
Set dummy base unit condition to Low Power. Then press "2" key.
RSSI B is registered.
4.To check RSSI value at the current condition, press "3".
5.Return to main menu(2) by pressing "*" key.

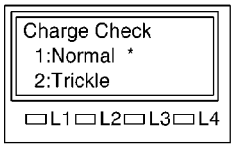
*RSSI is used to avoid the interrupted channel.
Refer to page for **11.4. Check about RF characteristics** (**11.4.1.1.** →**11.4.1.2.** →**11.4.1.5.**)

10.1.7. Battery Low Voltage Detection Adjustment/Check



Procedure
1.Press "4" key. Display changes to "Battery Low adjustment/check mode".
Set voltage of power supply to 2.37V.
2.Press "1" key. Voltage data is registered as threhold level of battery low detection in hexadecimal number.
3.Set to "Battery check mode" by pressing "2" key.
The adjusted value and the current value at A/D input are displayed in hexadecimal on LCD.
4.Return to main menu(2) by pressing "*" key.
*This mode is for adjusting threshold level of battery low detection.
If this level is high, battery cell on LCD is always blinking even if battery is fully charged.

10.1.8. Setting the Charging Control



Charge condition control mode

Procedure

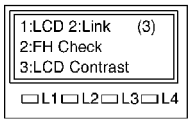
1.Press "5" key. Mode changes to charge control mode.

2.By pressing "1" key(Normal charge) or "2" key(Trickle), select charge control mode.

3.Return to main menu(2) by pressing "*" key.

*Charging current is controlled by cordless handset.
To check the charging current is proper, check charging current by using this test mode.This mode is used when measuring battery charge current with the charger.

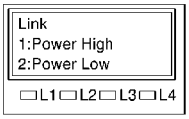
10.1.9. Link



At the condition that base unit is waiting for the signal from cordless handset.

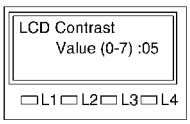
1.Press "2" key.
Display shows"Just a moment"

2.When cordless handset can be syncronized with base unit, display changes to below figure.



*Base uint and cordless handset can communicate in test mode.
Refer to **11.4.1.2. The method to set to TEST MODE LINK**. In this link frequency is not hopping.

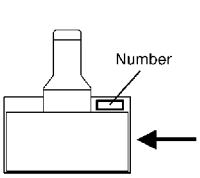
10.1.10. LCD Contrast



LCD contrast value should be changed by LCD to be used.

1.Press "4" key.

2.By pressing "1" key, this value is decreased.
5→4→3→2→1→7.....
By pressing "1" key, this value is increased.
5→6→7→1→2.....



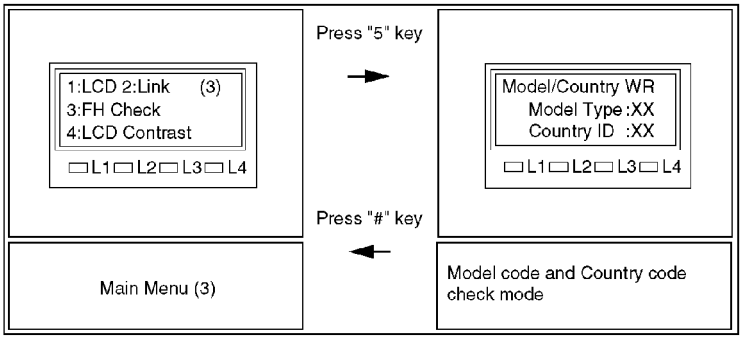
(Contrast)
Dark← →Light
0.....5.....7

In case of LNY163C02
Select 5
In case of PQADGP0741GN
Select 0

After seleting LCD contrast value press "#" key. By this procedure contrast value is fixed.

10.1.11. Model Code/Country Code

This item is used for entering Model code and Country code.
If EEPROM is changed to new one, this code should be checked.



1. Model code and country code can be changed by below step.

   By pressing "1" key, model code number is decreased (-1).
   By pressing "3" key, model code number is increased (+1).

   Model code is assigned→
   0: 2 LINE model (KX-TG2000B)
   1: 4 LINE model (KX-TG4000B)

   By pressing "4" key, country code number is decreased (-1).
   By pressing "6" key, country code number is increased (+1).

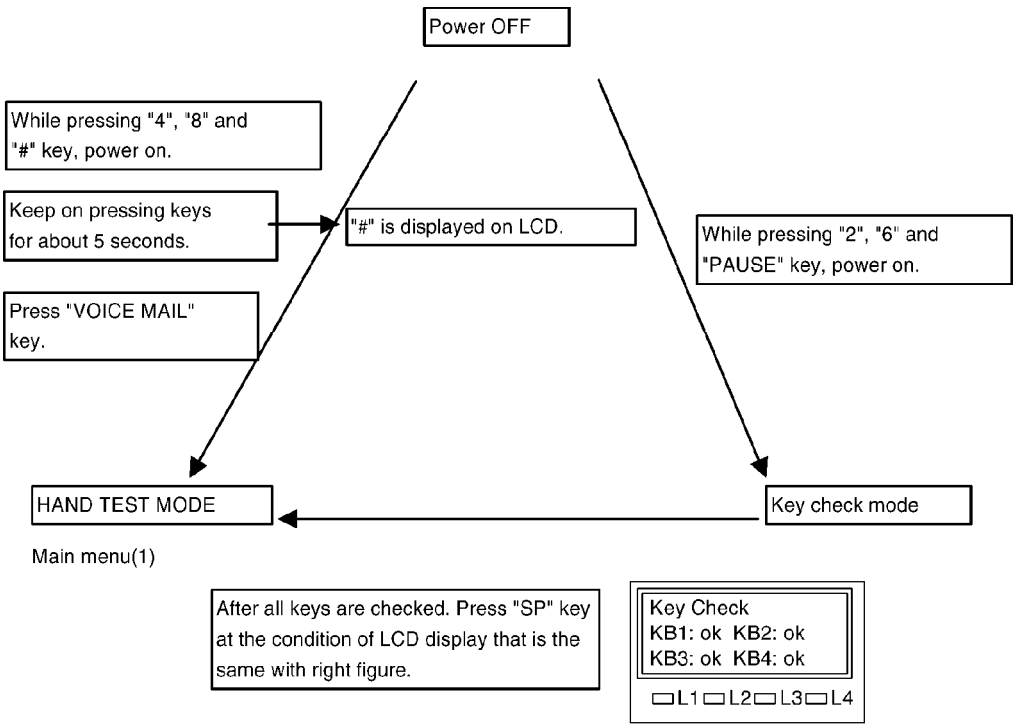
   Country code is assigned→
   0: USA model
   1: Canada model

   After inputting proper code, press "#" key, by pressing "#" key, these data is stored in EEPROM.
   To return to main menu (3), press "✳" key.

10.2. Test Mode Flow Chart for Maintenance of Base Unit

10.2.1. Test mode setting method 1

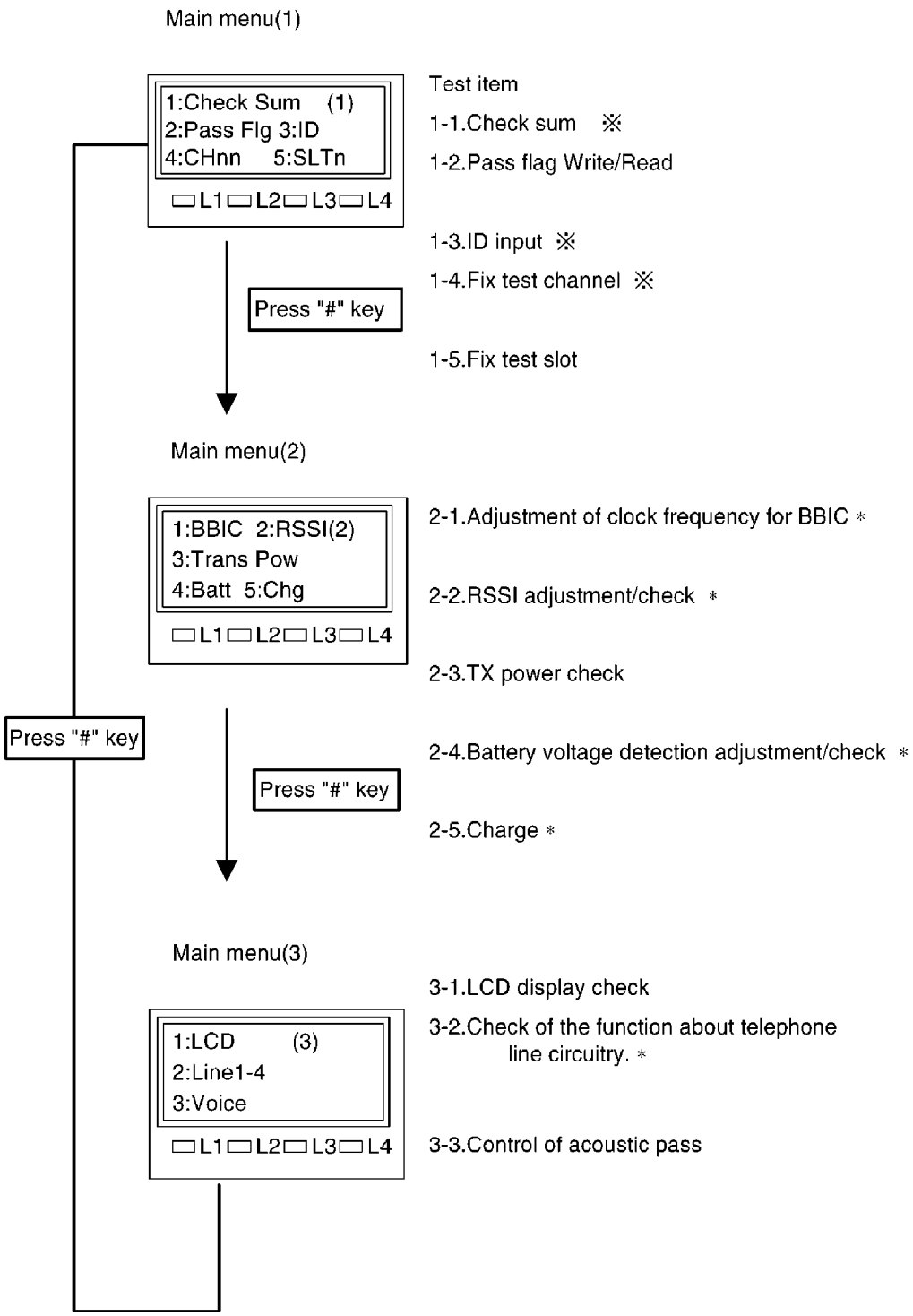
***Set hook SW handset to ON, except handset mode.**


Power OFF
While pressing "4", "8" and "#" key, power on.
Keep on pressing keys for about 5 seconds.
"#" is displayed on LCD.
While pressing "2", "6" and "PAUSE" key, power on.
Press "VOICE MAIL" key.
HAND TEST MODE
Key check mode
Main menu(1)
After all keys are checked. Press "SP" key at the condition of LCD display that is the same with right figure.
Key Check
KB1: ok KB2: ok
KB3: ok KB4: ok
L1 L2 L3 L4

Menu to test mode is displayed on LCD.
Test mode with * is used for maintenance.

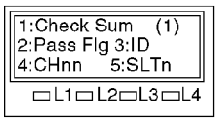
10.2.2. Test mode setting method 2

The explanation of transition between the hand test mode condition and the each mode.

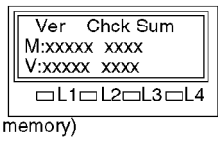


10.2.3. Check Sum

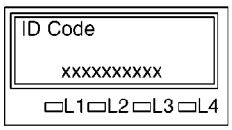
Main menu(1)



Procedure
1.Press "1" key.
2.Check version of ROM.
M:Rom(IC806) for Main CPU
⟶Software of main CPU(IC805) is in IC806(Flash memory)
V:Rom(IC703) for Sub CPU
⟶Software of sub CPU(IC701) is in IC703(Flash memory)
*Function of set is determined by this ROM version.



10.2.4. ID Check/Write

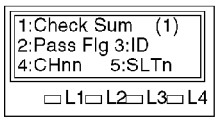


ID check/write mode

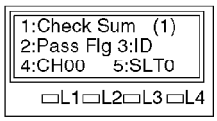
This data should not be written in normal repairing. Only when EEPROM(IC803) is exchanged to new one,same ID should be written in below process.
1.Press "3" key. ⟶ Current ID data is displayed. (In case of new EEPROM, all "0" is displayed.)
2.Enter the same ID number of last EEPROM in 10digits of hexadecimal.
See **11.1. Clock Frequency Adjustment (for base unit and cordless handset).**
3.To write it to EEPROM,press "#" key.
4.To exit ID check/write mode,press "*" key.

10.2.5. Fix Test Channel

Main menu(1)



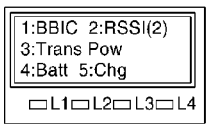
Fix test channel
Procedure
1.Press "4" key.



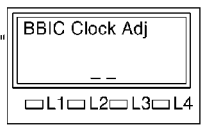
2.Input the channnel to be used in number of two digits. (00~93)
3.Set the channel to be inputted by pressing "#".
4.Return to main menu(1) by pressing "*" key.

*This select mode is used when changing channel. Normally use 00ch.
If you don't select "4",channel 00 is used.

10.2.6. Clock Adjustment/Confirmation



Procedure
1.Press "1" key. Display changes to "Clock adjustment/check mode"



2.Enter Frequency code of 2 digits in hexadecimal number.
See the process to adjust frequency.
3.Set the clock frequency by pressing "#".
By pressing "#" key,updated data is registered on EEPROM.
4.Return to main menu(2) by pressing "*"key.

*This select mode is used when calibrating clock frequency (10.368MHz).
Accuracy of clock freuency is important.
Refer to **11.1. Clock Frequency Adjustment (for base unit and cordless handset)** about detail.

10.2.7. RSSI Adjustment/Confirmation

Refer to Registration, The method to set to TEST MODE LINK and The method to adjust RSSI A, B .

10.2.8. Battery Voltage Detection Check

Procedure

1.Press "4" key. Display changes to "Battery check mode".

2.Set to "Battery low detect mode" by pressing "1" key.
Battery detect starts.
*Before pressing "1", don't supply DC voltage to battery connector.
If so, current from AC adaptor flow to battery connector.

3.Supply DC voltage to CHG_P(+) and CHG_M(-) (battery connector) of backside
When changing DC voltage, "BATTERY LED"condition changes as below.

Supply voltage	"BATTERY" LED condition
6.9V	ON
6.3V	Blinking
5.7V	OFF

4.Return to main menu(2) by pressing "*" key.

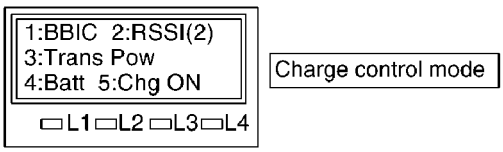
*"BATTERY" LED is used for indicating the condition of back-up battery.
This back-up battery is used at power failure.

(Explanation of back-up battery)
When set is working by AC power at the condition that back-up battery is connected, if power failure happens, back-up battery is available.
From AC power to back-up battery, power is changed automatically.
But if back-up battery is connected to set without AC power, set doesn't work. Back-up battery is used at AC power failure.

10.2.9. Battery Charge Control

1.Every time "5" key is pressed, charge condition is changed (ON/OFF).
Check whether charge control works properly by measuring battery terminal without battery.

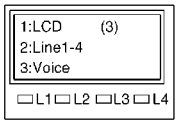
Charge OFF : less than 2 V
Charge ON : 10 ± 2 V



2.To return to menu(2), press "*" key.

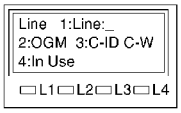
10.2.10. Function Check About Telephone Line Circuitry

Main menu(3)



Procedure

1.Press "2" key. Display changes to "Telephone line circuitry check mode".



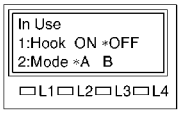
Telephone line circuitry check mode

2.Press "1" key. Condition changes to "Line selection condition".

3.Select the line to be used.

1:Line1, 2:Line2, 3:Line3, 4:Line4, 5:All line (Line1 ~ Line2) *_:This is not available.

4.Press "4" key. Mode changes to "IN USE DETECTION mode".



IN USE DETECTION mode

5.Press "1" key. Mode changes to "Selection mode of HOOK condition".

By moving "*", "HOOK" condition is selected.

Every time "1" is pressed, "*" is moved.

Pressing "*" key makes the HOOK condition fix.

6.Press "2" key. Mode changes to "Selection mode of IN USE condition".

By moving "*", "LINE Mode" condition is selected.

Every time "2" is pressed, "*" is moved.

Pressing "*" key makes LINE mode fix.

Display returns to Telephone line circuitry check mode.

7.Display returns to main menu(3) by pressing "*" key.

Mode A: telephone line for 48V, Mode B: telephone line for 24V.

To check whether IN USE Detection circuit works properly,

set condition to ON-Hook.

A mode T-R 27V LINE LED ON

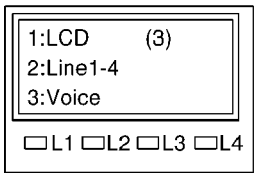
33V LINE LED OFF

B mode T-R 17V LINE LED ON

20V LINE LED OFF

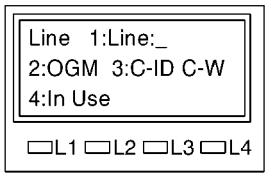
10.2.11. Check of the Function About Telephone Line Circuitry

Main menu(3)



Procedure

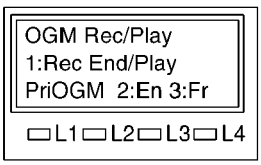
1.Press "2" key. Display changes to "Telephone line circuitry check mode".



Telephone circuitry check mode

2.Greeting record starts at the same time that "2" key is pressed.
At the same time the appointed line is caught.

*Greeting record is done from microphone of set.

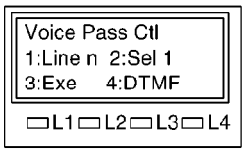


3.Greeting play starts to output to speaker of set at the same time that "1" key is pressed.

4.Pressing "2" key, message in voice prompt "thank you for calling" is played.

5.To return to main menu, press "*"

10.2.12. Link at Test Mode



1.Press "3" key at Main menu(3).

2.Press "2" key to select communication mode.

3.Press "4" key to communicate with cordless handset. (In case of cordless handset)

1: Handset

2: Headset

3: SP-phone

4: Cordless handset

4.Press "3" key.

In this process, base unit is waiting for signal from cordless handset.

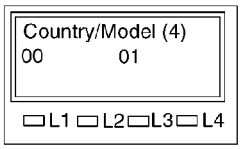
Refer to Registration, The method to set to TEST MODE LINK about details to use TEST MODE LINK.

10.2.13. Country/Model Code

This item is used for confirming country code and model code.
If this code is different, some function doesn't work properly.
This code can be changed by below process.

1. While pressing "4", "8" and "#" keys, power on. → "#" is displayed on LCD.

2. Press Intercom/Transfer "8" key. → Country/Model check mode.



On this display condition, input proper code in 4 digits.

3. Country code should be as below.
   USA: 00
   CANADA: 01

   Model code should be as below.
   2 LINE model: 00
   4 LINE model: 01

4. If different code was registered, enter correct number.

5. After entering correct number, press "#" key. By pressing "#", new code is stored.

6. Power off.

11. ADJUSTMENT

11.1. Clock Frequency Adjustment (for base unit and cordless handset)

(Cordless Handset)

1. Set to hand test mode.

2. Press “#” key. → Main menu(2).

3. Press “1” key. → Clock adjustment mode.

4. Enter “805D” (in hexadecimal number) as initial value. Refer to hexadecimal number. (Table A)
8: “8” key, 0: “0” key, 5: “5” key, D: “BACK” key.

5. Press “#” key.

6. Measure the frequency at test point of SYRI.

7. Calculate the frequency difference between the current frequency and 10.368 MHz.
ex.) Measure frequency is 10,368,120 Hz. Frequency difference to 10,368,000 Hz is +120 Hz.

8. Enter “80CB”. (4 hexadecimal number referring to table B)

9. Press “#” key.

10. By pressing "✳", return to menu.

11. Check the frequency at test point of SYRI.
Frequency should be 10.368 MHz ±30 Hz.

(Base Unit)

1. Set to hand test mode.

2. Press "#" key.
Measure clock frequency at test point "SYRI". If frequency difference between it and 10.368MHz is within ±31Hz, OK. If out of range, go to next step.

3. Press "1" key. → Clock adjustment mode.

4. Enter "74" (in hexadecimal number) as initial value. Refer to Table A.

5. Press "#" key.

6. Measure the frequency at test point of SYRI.

7. Calculate the frequency difference between the current frequency and 10.368 MHz.
ex.) Measure frequency is 10,368,120 Hz. Frequency difference is + 120 Hz.

8. Enter "47" (2 hexadecimal number referring to table C).

9. Press "#" key.

10. Measure the frequency at test point of SYRI.

11. By pressing "✳", return to menu.
Frequency should be 10.368 MHz ±30 Hz.

Table A

(Key to Hexadecimal number)	
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
UP	A
FWD	B
DOWN	C
BACK	D
FUNC	E
EXIT	F

Table B (Clock adjustment table for cordless handset)

Frequency	Value	Frequency	Value
-300Hz	80 0A	+10Hz	80 60
-290Hz	80 0C	+20Hz	80 62
-280Hz	80 0E	+30Hz	80 67
-270Hz	80 10	+40Hz	80 6A
-260Hz	80 13	+50Hz	80 6F
-250Hz	80 14	+60Hz	80 72
-240Hz	80 18	+70Hz	80 77
-230Hz	80 1A	+80Hz	80 7A
-220Hz	80 1C	+90Hz	80 BF
-210Hz	80 1E	+100Hz	80 C2
-200Hz	80 21	+110Hz	80 C7
-190Hz	80 223	+120Hz	80 CB
-180Hz	80 26	+130Hz	80 D0
-170Hz	80 29	+140Hz	80 D4
-160Hz	80 2C	+150Hz	80 D8
-150Hz	80 2E	+160Hz	80 DD
-140Hz	80 31	+170Hz	80 E1
-130Hz	80 34	+180Hz	80 E7
-120Hz	80 37	+190Hz	80 EC
-110Hz	80 3A	+200Hz	80 F1
-100Hz	80 3C	+210Hz	80 F7
-90Hz	80 3F	+220Hz	80 FC
-80Hz	80 42	+230Hz	81 C2

-70Hz	80 46	+240Hz	81 C7
-60Hz	80 49	+250Hz	81 CE
-50Hz	80 4A	+260Hz	81 D3
-40Hz	80 50	+270Hz	81 D8
-30Hz	80 52	+280Hz	81 DF
-20Hz	80 56	+290Hz	81 E6
-10Hz	80 59	+300Hz	81 EA

Table C (Clock adjustment table for base unit)

Frequency	Value	Frequency	Value
+250	11	-10	77
+240	15	-20	7B
+230	19	-30	7E
+220	1D	-40	82
+210	21	-50	85
+200	25	-60	89
+190	29	-70	8D
+180	2D	-80	90
+170	32	-90	94
+160	36	-100	98
+150	3A	-110	9C
+140	3E	-120	A0
+130	43	-130	A4
+120	47	-140	A8
+110	4B	-150	AD
+100	50	-160	B1
+90	53	-170	B6
+80	58	-180	BA
+70	5C	-190	BF
+60	60	-200	C3
+50	63	-210	C8
+40	66	-220	CC
+30	6A	-230	D1
+20	6D	-240	D5
+10	70	-250	DA
0	74		

11.2. Battery Low Adjustment

(Cordless Handset)

1. Set to hand test mode. → menu (1).

2. Press “#” key. → menu (2).

3. Press “4” key. → Batt.Low adjustment mode.
4. Change DC voltage of battery terminal to 2.37 V.
5. Press “1” key. → Battery Low detect voltage is registered.
6. Press “#” key.
7. By pressing “✳”, return to menu mode.
   Adjustment spec. of battery low is DA to E1.

11.3. Battery Detection Confirmation (This item is not for adjustment.)

(Base unit: Backup battery)

1. Set to hand test mode. → menu (1).
2. Press “#” key. → menu (2).
3. Press “4” key. → Batt.Low check mode.
4. Press “1” key. → Battery detection mode starts.
   Supply DC voltage to battery connector.
5. Change DC voltage of battery terminal to 6.9 V.
6. Check that back-up LED is on.
7. Change DC voltage of battery terminal to 6.3 V.
8. Check that back-up LED is blinking.
9. Change DC voltage of battery terminal to 5.7 V.
10. Check that back-up LED is off.
    Remove DC power supply.
11. By pressing “✳”, return to menu mode (2).

11.4. Check about RF characteristics

(In case of base set adjustment)
To set RSSI adjustment mode, base unit and cordless handset should be in test link mode. / When adjusting RSSI value of base unit, cordless handset should be dummy set supplied by KME. / As well when adjusting RSSI value of cordless handset, base unit should be dummy set supplied by KME. / In advance they should be registered.
Use the dummy cordless handset. Set SW to super low mode.
After step 1 to 11 (Test link procedure),

11.4.1. Inspection (Dummy set - product)

Before judging which has failure in base unit or cordless handset, the registration needs to be

done between dummy set and product.
Dummy set has the below characteristics.
Dummy set has the switch to change TX power at the back of cabinet.

(Low Power)
Lower power level than normal product. "At this level, RSSI B of product can be adjusted on the radiation condition, not PCB."
Worse sensitivity than normal product. "At this sensitivity, radiation power of product can be checked by measuring RSSI level." by oscilloscope.

(Super Low Power)
Lower power level than "Low power condition". At this level, RSSI A of product can be adjusted on the radiation condition, not PCB.
Sensitivity is same with "Lower Power condition".

11.4.1.1. Registration

Set power switch of dummy set to Low Power side.

Registration between dummy cordless handset and base unit (product)

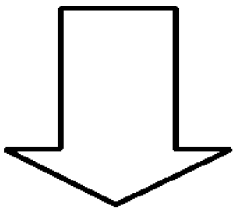
1. **The registration information of last base unit registered in dummy cordless handset should be deleted. → After deregistration the display on LCD should be [—].**
2. **Check power switch position of dummy cordless handset is "Low Power" side.**
3. **Execute the registration between dummy cordless handset and base unit.**

(Base unit)
2-1. At stand-by condition, press "FUNCTION" button.
2-2. Select "Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
2-3. Select "HS Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
2-4. Check the display on LCD is "Handset registering".

(Cordless handset)
On this condition of base unit,
2-5. At stand-by condition, press "FUNCTION" button.
2-6. Select "Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
2-7. Select "HS registration" by pressing "UP" or "DOWN" key.

2-8. If beep of cordless handset sounds, the registration between base set and cordless handset finishes.
2-9. To exit registration mode, press "EXIT" key of base unit.

Note
This registration should be done within one minute. If any process are not done in one minute, registration mode is exited.



Check whether base unit has faults.

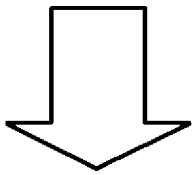
Registration between dummy base unit and cordless handset (product)

1. **The registration information of base unit registered in cordless handset should be deleted. → After deregistration, the display on LCD should be [—].**
2. **Check power switch position of dummy base unit is "Low Power" side.**
3. **Execute the registration between dummy base unit and cordless handset.**

(Base unit)
2-1. At stand-by condition, press "FUNCTION"" button.
2-2. Select "Registration "by pressing "UP" or "DOWN" key. Then press "FWD" key.
2-3. Select "HS Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key.
2-4. Check the display on LCD is "Handset registering".

(Cordless handset)
On this condition of base unit,
2-5. At stand-by condition, press "FUNCTION" button.
2-6. Select "Registration" by pressing "UP" or "DOWN" key. Then press "FWD" key."
2-7. Select "HS registration" by pressing "UP" or "DOWN" key.
2-8. If beep of cordless handset sounds, the registration between base unit and cordless handset finishes.
2-9. To exit registration mode, press "EXIT" key of base unit.

Note
This registration should be done within one minute. If any process are not done in one minute, registration mode is exited.



Check whether cordless handset has faults.

11.4.1.2. The method to set to TEST MODE LINK

Registration between product and dummy set needs before LINK test. Set power switch of dummy set to Low Power side.

(Base Unit)

1. **While pressing "4","8" and "#", power on. → "#" on LCD is displayed.**
2. **Press "VOICE MAIL" key. → It becomes TEST MODE main menu(1).**
3. **Press "#" key twice. → It becomes TEST MODE main menu(3).**
4. **Press "3" key. (VOICE) → It becomes Voice Pass menu.**
5. **Press "2" key. (Select) → It becomes mode selection condition.**
6. **Press "4" key. → It becomes voice pass mode to cordless handset.**

Select 1: Base handset
Select 2: Base headset
Select 3: SP-phone
Select 4: Cordless handset

7. **Press"3"key. (Execute) → Voice pass to cordless handset is connected.**
   (Cordless handset)
8. **While pressing "4", "8" and "#", connect battery. → "✳" on LCD is displayed.**
   *** If "✳" on LCD is not displayed by connecting battery, charge on**

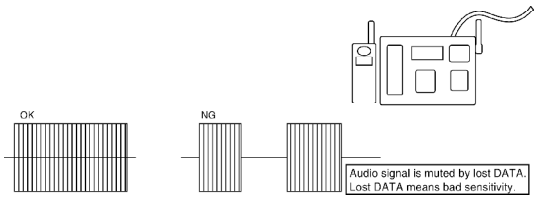
charger for a few seconds while pressing"4", "8" and "#".

9. Press "CONF" key. → It becomes TEST MODE main menu(1).
10. Press "#" key twice. → It becomes TEST MODE main menu(3).
11. Press "2" key. (LINK) → After cordless handset can synchronize with base unit, cordless handset send TX DATA to base unit. Then LINK is carried out.

11.4.1.3. Radiation sensitivity check

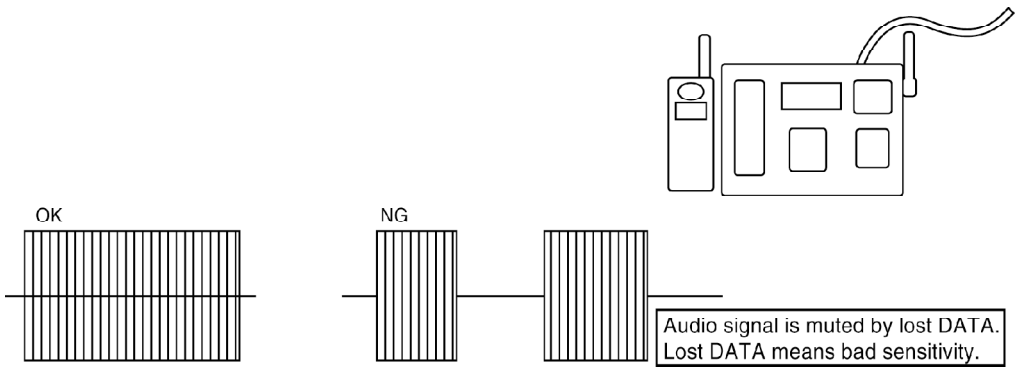
Registration between product and dummy set needs before LINK test.
Set power switch of dummy set to Low Power side.
— Put cordless handset on the left side of base unit.
— Raise antenna of base unit vertically to the desk.
— Put cordless handset on the desk so that LCD side of cordless handset faces upwards.
In case that dummy set is cordless handset. → It means that set under sensitivity test is base unit of product.
Set both base unit and dummy cordless handset to TEST MODE.
Execute Link in test mode condition.

1. Input acoustic signal to MIC of cordless handset.
2. Check whether there is no noise in line output(L1). If there is no signal in line output or sometimes signal to line output is muted as below figure, sensitivity of base unit is bad.



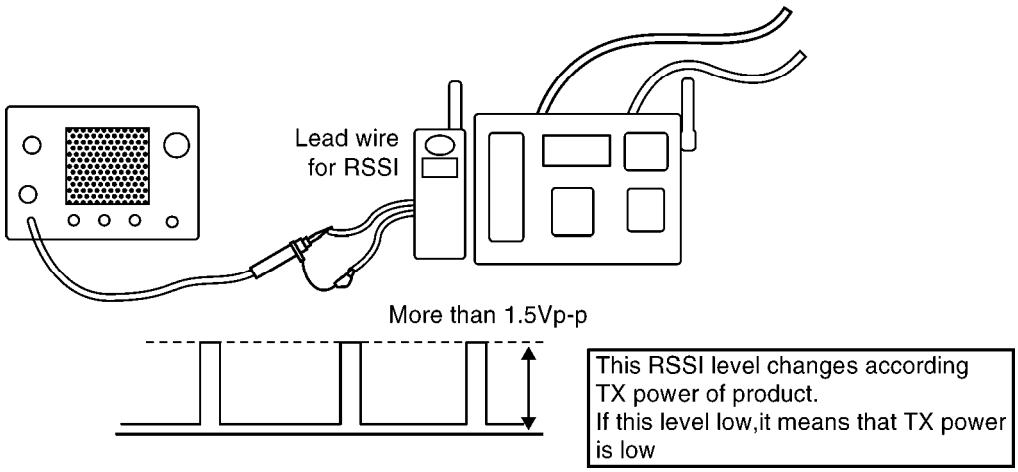
In case that dummy set is base unit. → It means that set under sensitivity test is cordless handset of product.
Set both dummy base unit and cordless handset to TEST MODE.
Execute Link in test mode condition.

1. Input signal to line(L1).
2. Check whether there is no noise in speaker output of cordless handset. If there is no signal in speaker output or sometimes signal to speaker output is muted as below figure, sensitivity of cordless handset is bad.

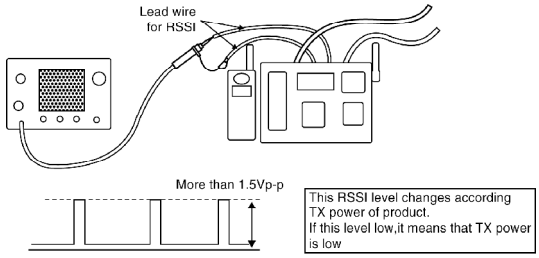


11.4.1.4. Radiation power check

Registration between product and dummy set needs before LINK test.
Set power switch of dummy set to Low Power side.
— Put cordless handset on the left side of base unit.
— Raise antenna of base unit vertically to the desk.
— Put cordless handset on the desk so that LCD side of cordless handset faces upwards.
In case that dummy set is cordless handset. → It means that set under radiation power check is base unit.
Set both base unit and dummy cordless handset to TEST MODE.
Execute Link in test mode condition.
Measure RSSI level of dummy cordless handset by oscilloscope as below figure.
RSSI level : More than 1.5Vp-p
By measuring RSSI of dummy set, radiation power of product can be checked.



In case that dummy set is base unit. → It means that set under radiation power check is cordless handset.
Set both dummy base unit and cordless handset to TEST MODE.
Execute Link in test mode condition.
Measure RSSI level of dummy base unit by oscilloscope.
RSSI level : More than 1.5Vp-p
By measuring RSSI of dummy set, radiation power of product can be checked.



11.4.1.5. The method to adjust RSSI A, B

Registration between product and dummy set needs before LINK test.
— Put cordless handset on the left side of base unit.
— Raise antenna of base unit vertically to the desk.
— Put cordless handset on the desk so that LCD side of cordless handset faces upwards.
In case that dummy set is cordless handset. → It means that set under adjusting RSSI is base unit.

(RSSI adjustment for base unit)
Set both base unit and dummy cordless handset to TEST MODE.
Execute Link in test mode condition.

1. **Set power switch of dummy cordless handset to "Super Low Power" side. To adjust RSSI A of base unit, execute next process to base unit.**
2. **Press "✳" key twice → By this procedure, line is released, but LINK is continued.**
3. **Press "#" key twice. → TEST MODE main menu(2)**
4. **Press "2" key to set to RSSI adjustment mode.**
5. **Press "1" key. → RSSI A**
6. **Press "3" key. → By this procedure, RSSI A value is written in memory.**
   *** Power switch of dummy cordless handset should be "Super Low Power" side.**
7. **Power off base unit.**
8. **Execute the same procedure with Step 1 to 7 of B (the method to set to TEST MODE LINK.)**
9. **Set power switch of dummy cordless handset to "Low Power" side. To adjust RSSI B of base unit, execute next process to base unit.**

10. Press "✳" key twice. → By this procedure, line is released, but LINK is continued.
11. Press "#" key twice. → TEST MODE main menu(2)
12. Press "2" key to set to RSSI adjustment mode.
13. Press "2" key. → RSSI B
14. Press "3" key. → By this procedure, RSSI B value is written in memory.
    * Power switch of dummy cordless handset should be "Low Power" side.
15. Power off base unit.

Adjustment spec. of RSSI is:
RSSI A: 5480 to 95C0
RSSI B: 8140 to A640
RSSI B > RSSI A

In case that dummy set is base unit. → It means that set under adjusting RSSI is cordless handset.

(RSSI adjustment for cordless handset)
Set both base unit and dummy cordless handset to TEST MODE.
Execute Link in test mode condition.

1. Set power switch of dummy base unit to "Super Low Power" side. To adjust RSSI A of cordless handset, execute next process to cordless handset.
2. Press "✳" key. → TEST MODE main menu(3)
3. Press "# " key twice. → TEST MODE main menu(2)
4. Press "2" key. → RSSI adjustment mode
5. Press "1" key. → By this procedure, RSSI A value is written in memory.
6. Set power switch of dummy base unit to "Low Power" side.
7. Press "2" key. → By this procedure, RSSI B value is written in memory.
8. To exit RSSI adjustment mode, press "✳" key.

9. Power off.

Adjustment spec. of RSSI is:
RSSI A: 44 to 70
RSSI B: 5B to B5
RSSI B > RSSI A

11.5. Frequency Table (MHz) for Base Unit and Cordless Handset

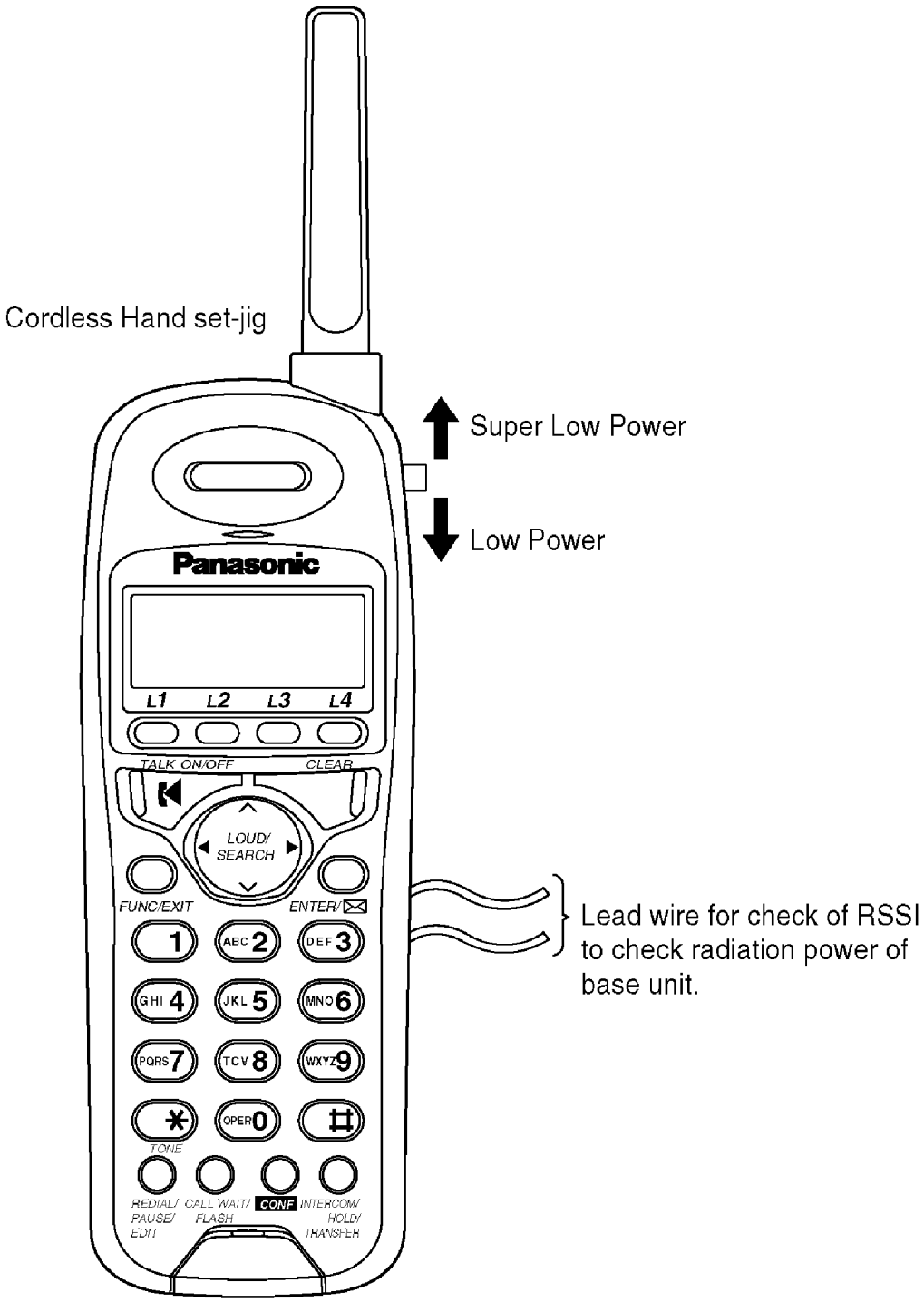
Table of channel frequency
TX frequency = RX frequency

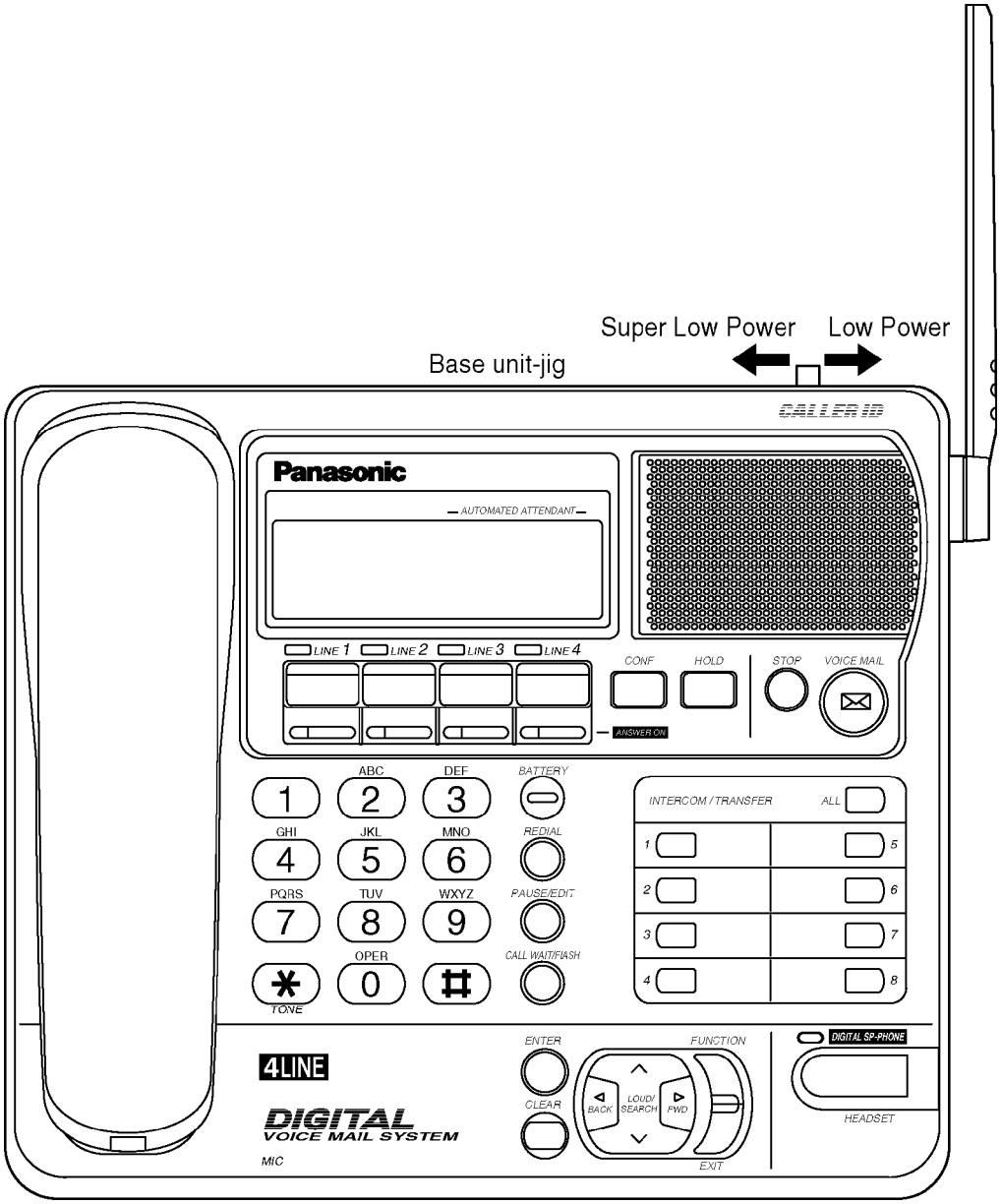
CH	Frequency	CH	Frequency	CH	Freque
00	2401.056	32	2428.704	64	2456.3
01	2401.920	33	2429.568	65	2457.2
02	2402.784	34	2430.432	66	2458.0
03	2403.648	35	2431.296	67	2458.9
04	2404.512	36	2432.160	68	2459.8
05	2405.376	37	2433.024	69	2460.6
06	2406.240	38	2433.888	70	2461.5
07	2407.104	39	2434.752	71	2462.4
08	2407.968	40	2435.616	72	2463.2
09	2408.832	41	2436.480	73	2464.1
10	2409.696	42	2437.344	74	2464.9
11	2410.560	43	2438.208	75	2465.8
12	2411.424	44	2439.072	76	2466.7
13	2412.288	45	2439.936	77	2467.5
14	2413.152	46	2440.800	78	2468.4
15	2414.016	47	2441.664	79	2469.3
16	2414.880	48	2442.528	80	2470.1
17	2415.744	49	2443.392	81	2471.0
18	2416.608	50	2444.256	82	2471.9
19	2417.472	51	2445.120	83	2472.7
20	2418.336	52	2445.984	84	2473.6
21	2419.200	53	2446.848	85	2474.4
22	2420.064	54	2447.712	86	2475.3
23	2420.928	55	2448.576	87	2476.2
24	2421.792	56	2449.440	88	2477.0
25	2422.656	57	2450.304	89	2477.9
26	2423.520	58	2451.168	90	2478.8
27	2424.384	59	2452.032	91	2479.6
28	2425.248	60	2452.896	92	2479.6
29	2426.112	61	2453.760	93	2479.6

CH	Frequency	CH	Frequency	CH	Freque
30	2426.976	62	2454.624		
31	2427.840	63	2455.488		

11.6. Replacement of EEPROM (IC4 for Cordless Handset, IC803 for Base Unit)

Some data are written in EEPROM. (Gain parameter, frequency code, RSSI code, ID etc.) / If EEPROM is changed to new one, some data of them are written as initial value automatically. / But ID should be inputted and, frequency, battery low (only cordless handset) and RSSI should be adjusted.

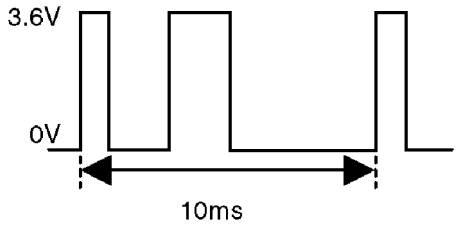
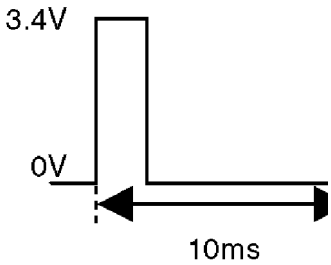

Cordless Hand set-jig
Super Low Power
Low Power
Panasonic
L1
L2
L3
L4
TALK ON/OFF
CLEAR
LOUD/
SEARCH
FUNC/EXIT
ENTER/
1
ABC 2
DEF 3
GHI 4
JKL 5
MNO 6
PQRS 7
TCV 8
WXYZ 9
OPER 0
TONE
REDIAL/
PAUSE/
EDIT
CALL WAIT/
FLASH
CONF
INTERCOM/
HOLD/
TRANSFER
Lead wire for check of RSSI
to check radiation power of
base unit.



Remove back-up battery, when checking function, and setting to test mode.

11.7. Check Table for RF Block

		Base unit	Cordless handset
1 Registration & Link confirmation Refer to Registration	Procedure	1 Deregistration base unit and dummy cordless handset 2 Set Dummy power SW to Low Power 3 Registration 4 Press “Talk” key of Dummy cordless handset	1 Deregistration cordless ha and dummy base unit 2 Set Dummy power SW to L Power 3 Registration 4 Press “Talk” key of cordle handset
	Check point	1 Check ID of base unit (Test Mode main menu (1))	1 Check ID of cordless hand (Test Mode main menu (1)
2 10.368MHz reference clock confirmation Refer to Clock Frequency Adjustment (for base unit and cordless handset)	Procedure	1 Select / “BBIC (Clock Adjust/ confirmation)” mode (Test Mode main menu (2)) 2 Confirm clock frequency within 10.367969MHz~10.368031MHz at SYRI 3 When without Spec, input HEX code for adjusting Frequency. (Refer to Clock adjustment Table)	1 Select / “BBIC (Clock Adju confirmation)” mode” (Test Mode main menu (2) 2 Confirm clock frequency v 10.367969MHz~10.368031M SYRI 3 When without Spec, input code for adjusting Freque (Refer to Clock adjustmen
	Check point	1 Check some parts that are / X802, C889, C887, D814, R846 and R847.	1 Check some parts that are C32.
3 Tx Data confirmation	Procedure	1 Select “Trans Pow” mode (Test Mode main menu (2) - 3) 2 Select Data pattern “3” 3 When press “#” key, output Tx power and Tx Data 4 Confirm Tx Data level at RF terminal within 150mVp-p~250mVp-p Pin 22 of RF unit	1 Select “Trans Pow” mode (Test Mode main menu (2) 2 Select Data pattern “3” 3 When press “#” key, outpu power and Tx Data 4 Confirm Tx Data level at R terminal within 150mVp-p~250mVp-p Pin unit
	Check point	1 Check some parts that are R879, R928, R881, C855, C856, C857, L801, L802 and IC818.	1 Check some parts that are IC1.
4 Tx Power control confirmation	Procedure	1 Select “Trans Pow” mode (Test Mode main menu (2) - 3)	1 Select “Trans Pow” mode (Test Mode main menu (2)

		Base unit	Cordless handset
		2 Select Data pattern “3” 3 When press “#” key, output Tx power and Tx Data 4 Confirm “DRON Pin 30 of RF unit” (Tx Power control signal) waveform at RF terminal 	2 Select Data pattern “3” 3 When press “#” key, outpu power and Tx Data 4 Confirm “DRON Pin 30 of (Tx Power control signal) at RF terminal 
	Check point	1 Check R895 and IC818.	1 Check R95 and R72.
5 Tx Power / confirmation Refer to Radiation power check	Procedure	1 Set Test mode Link to base unit and dummy cordless handset. / (Fixed channel link / Dummy Power SW: Low) 2 When base unit cannot link to dummy cordless handset, check RF unit following RF check flowchart. 3 Put base unit on the right side of dummy cordless handset. 4 Confirm RSSI level on the dummy cordless handset by using oscilloscope. RSSI Level: More than 1.5V	1 Set Test mode Link to cor handset and dummy base (Fixed channel link / Dumn SW: normal) 2 When cordless handset ca to dummy base unit, chec following RF check flowch 3 Put cordless handset on t side of dummy base unit. 4 Confirm RSSI level on the by using oscilloscope. (Select “RSSI” mode on du base unit) RSSI Level: More than 1.5
	Check point	1 Check Antenna and RF unit	1 Check Antenna and RF un

		base unit	cordless handset
5 Rx Data & / RXDSG confirmation	Procedure	1 Set “Registration Mode”. / (Normal operation mode, no Test Mode)” 2 Confirm “RXDSG (Pin9 of RF unit)” (Rx S/H control signal) waveform at RF terminal 3 Confirm “RXDA / RXDB” (Rx receiving Data) waveform at RF terminal *S/H : Sample and hold mode	1 Set “Registration Mode”. / operation mode, no Test M 2 Confirm “RXDSG (Pin9 of (Rx S/H control signal) wa RF terminal 3 Confirm “RXDA / RXDB” (I receiving Data) waveform terminal *S/H : Sample and hold mc
	Check point	(RXDSG) 1 Check R887 and IC818, C870. (RXDA/RXDB) 1 In the case that waveform is none, replace RF unit. 2 In the other case (waveform is abnormal), check R893 and R888.	(RXDSG) 1 Check R96 and IC1, C91. (RXDA/RXDB) 1 In the case that waveform replace RF unit. 2 In the other case, check R C62 and C65.
5 Rx Sensitivity / confirmation Refer to Radiation sensitivity check	Procedure	1 Set Test mode Link to base unit and dummy cordless handset. / (Fixed channel link / Dummy Power SW: Low) 2 When base unit cannot link to dummy cordless handset, check RF unit following RF check flowchart. 3 Put base unit on the right side of dummy cordless handset. 4 Confirm there is no noise in line output signal.	1 Set Test mode Link to cor handset and dummy base (Fixed channel link / Dumn SW: Low) 2 When cordless handset ca to dummy base unit, chec following RF check flowch 3 Put cordless handset on tl side of dummy base unit. 4 Confirm there is no noise i output signal.
	Check point	1 Check Antenna and RF unit	1 Check Antenna and RF un
6 RSSI adjustment Refer to The method to adjust RSSI A, B RSSI A RSSI B	Procedure	1 Set Test mode Link to base unit and dummy cordless handset. / (Fixed channel link / Dummy Power SW: Super Low Power) 2 When base unit cannot link to dummy cordless handset, check RF unit following RF check flowchart. 3 Put base unit about 2m away from dummy cordless handset. 4 “Select RSSI A” store mode. 5 Change Dummy power SW to "Low Power".	1 Set Test mode Link to cor handset and dummy base (Fixed channel link / Dumn SW: Super Low Power) 2 When cordless handset ca to dummy base unit, chec following RF check flowch 3 Put cordless handset on tl side of base unit. 4 “Select RSSI A” store mod 5 Change Dummy power SW Power".

		base unit	cordless handset
		6 “Select RSSI B” store mode. * Refer to in Check about RF characteristics in detail.	6 “Select RSSI B” store moc * Refer to in Check about I characteristics in detail.
	Check point	1 Check Antenna and RF unit	1 Check Antenna and RF un

12. REPLACEMENT OF RF UNIT

12.1. Procedure to remove RF unit

Solder iron jig for replacement of RF unit consists of solder iron, heater, magnet, pin, temperature control box, PCB fixture and fence for safety.
This jig can be used for both base unit and cordless handset by exchanging fixture.
In case of base unit, push C860 toward the edge of circuit board before removing RF unit.

12.1.1. Type 1

There are two types of desoldering jig as shown below.

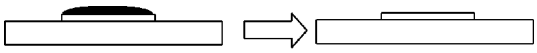
1. **Connect AC power. (This jig needs two AC power.) Then set heater SW to ON.**
2. **Set fixture for base unit or cordless handset to jig. → See "Picture 2".**
3. **Set solder iron temperature to 270°C. → See "Picture 3".**
   3-1. Push "Mode button". → "SV" mark on display is ON. This mark means temperature adjustment mode.
   3-2. Set solder iron temperature to 260 - 270°C by pushing up & down button.
   3-3. Again push "Mode button". Then confirm that "SV" mark on display is OFF.
   3-4. Check that mark of "Heater ON/OFF" is on.
4. **It will take about 30 minutes to make solder iron warm.**
5. **After solder iron warms, set circuit board on fixture.**
6. **Press solder iron on circuit board by pressing down lever.**
7. **Keep on pressing down for about 40 seconds.**
8. **Return lever to original position. → Simultaneously RF unit is lifted.**
9. **Remove circuit board that RF unit was removed.**

10. Move a kind of plate under solder iron.

11. Remove RF unit that was lifted by magnet by pushing bar. → See "Picture 6 and Picture 7".

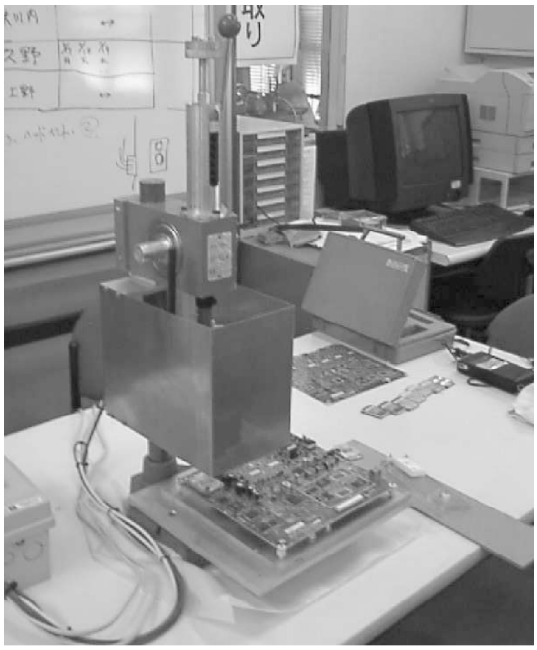
***Pay attention not to touch RF unit directly because RF unit is hot.**

12. Remove solder on the pad of removed RF unit.

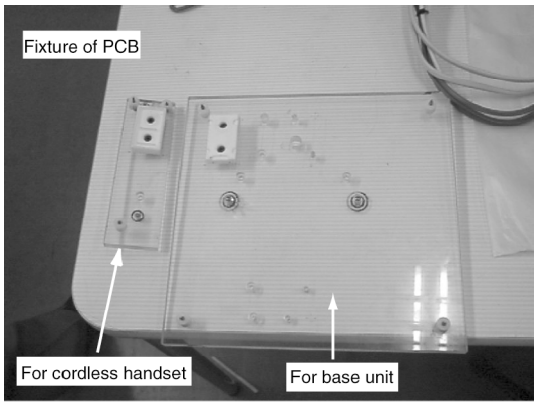


13. Put new RF unit on circuit board, then solder.

Picture 1

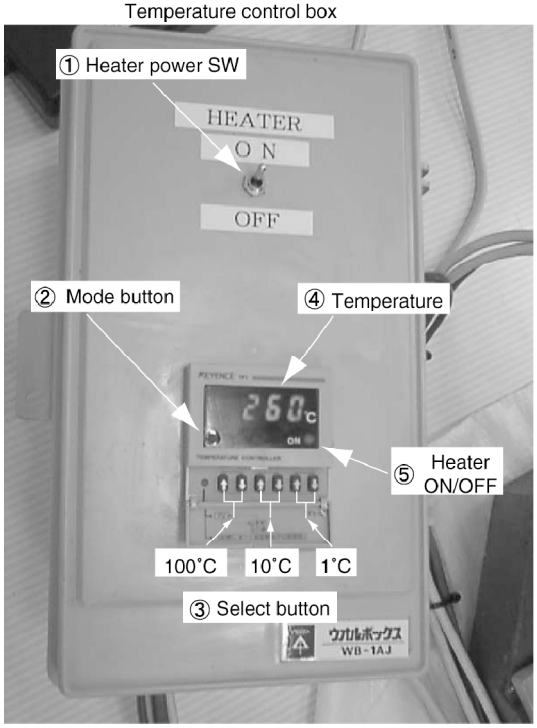


Picture 2

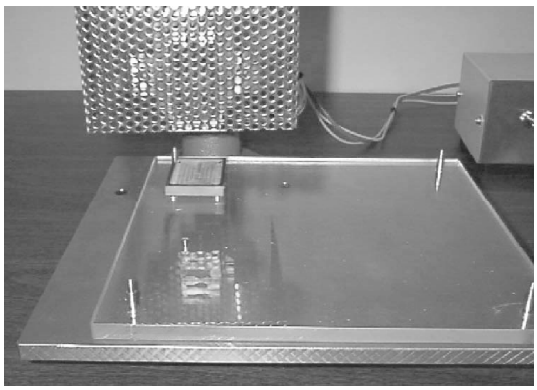


Picture 3

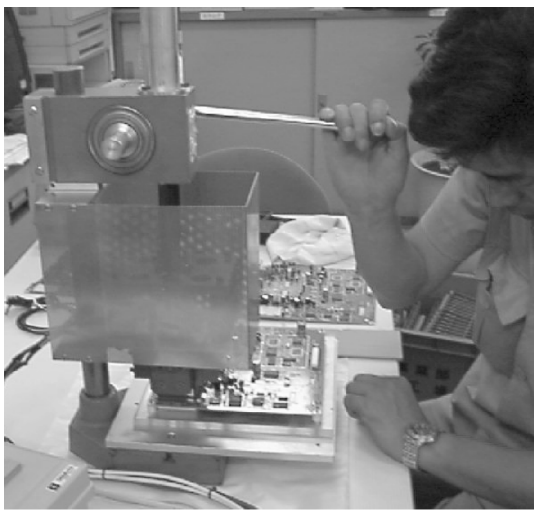
Temperature control box



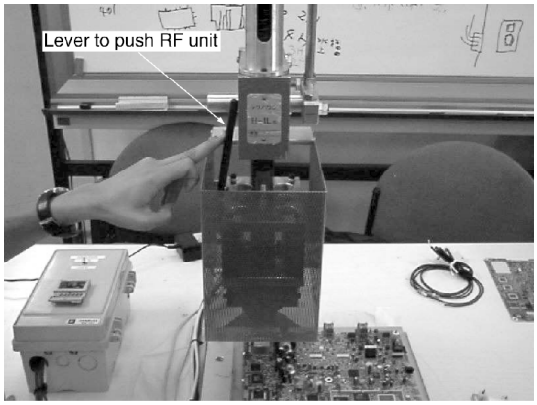
Picture 4



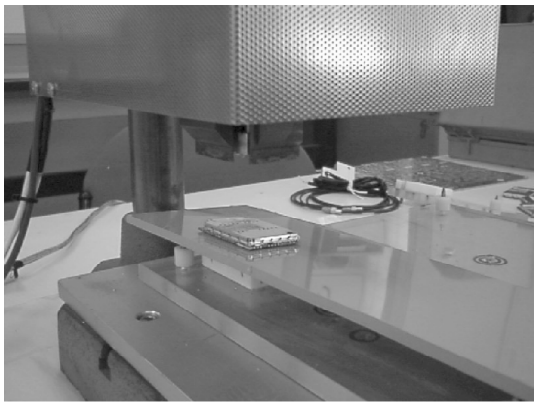
Picture 5



Picture 6



Picture 7

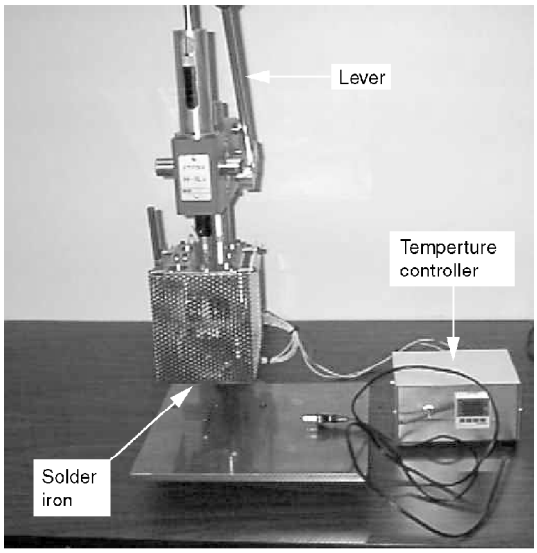


12.1.2. Type 2

12.1.2.1. Structure

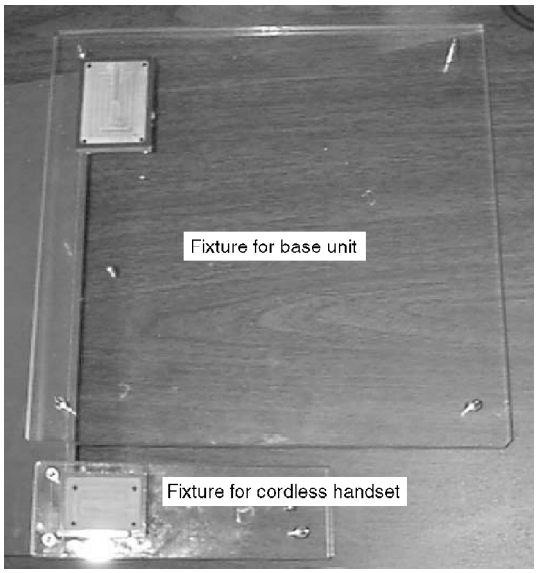
1. Main

This jig consists of lever, solder iron, fence and temperature controller.



2. Fixture

Fixture to fix PC board on jig. For base unit, for cordless handset.



3. Temperature Controller
Controller to keep proper temperature.

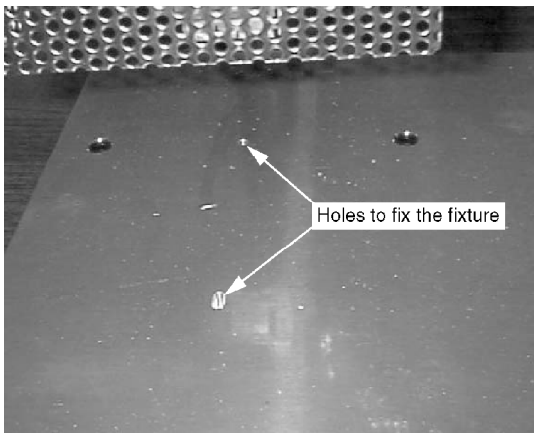
12.1.2.2. Power ON & Set Temperature

1. **Power SW on.**
2. **Set temperature to 270 degree(C) by pressing up and down key.**
   Red number shows target temperature.
   Green number shows actual temperature.
3. **After setting temperature, press “ENT” key.**
4. **It takes 30 minutes to reach proper temperature.**

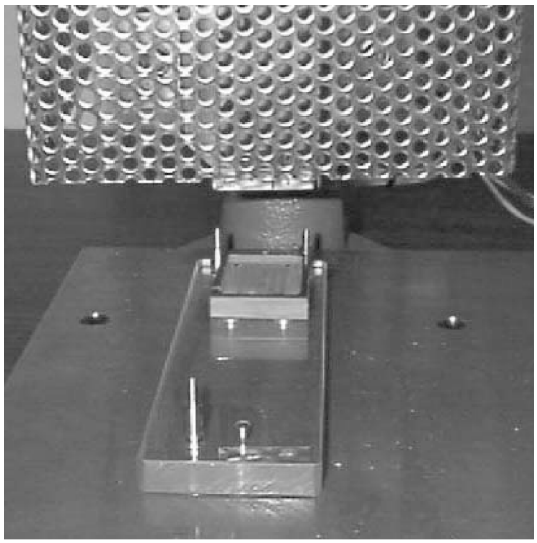
12.1.2.3. Set Fixture on Desoldering Jig

1. Set each fixture on the stand.

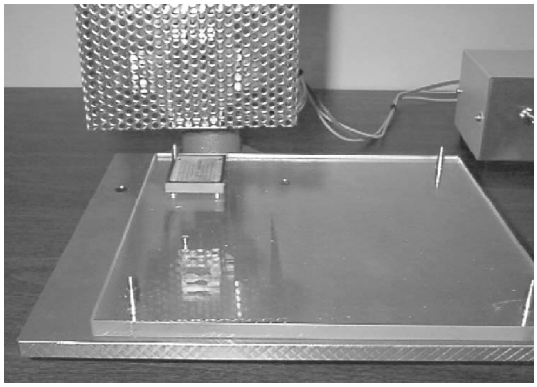
(Stand)



(For cordless handset) / Fixture for cordless handset is set on stand.

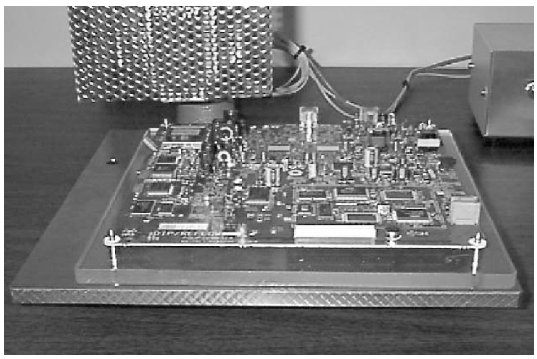


(For base unit) / Fixture for base unit is set on stand.



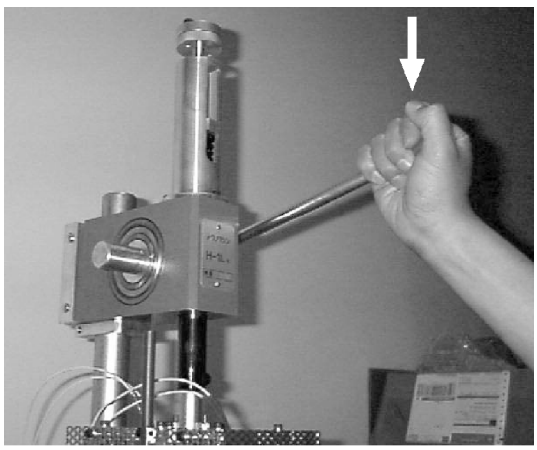
12.1.2.4. Set PC Board on Fixture

1. **Set PC board on fixture.**
   In case of base unit PC broad, bend C860 toward edge of PC board.



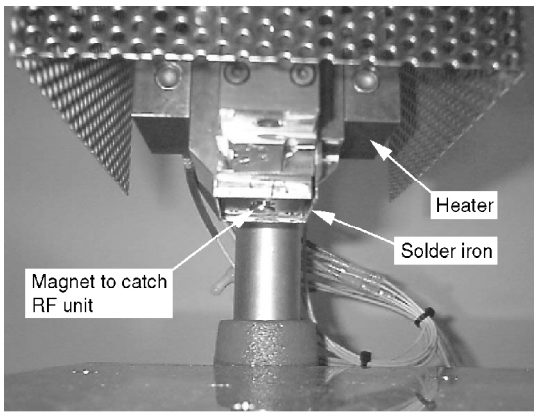
12.1.2.5. Pull Down Lever

1. **Check if actual temperature on controller equals to target temperature.**
2. **While pulling down lever, adjust position of solder iron so that fit to RF unit position.**
3. **Keep pulling down lever firmly for 40 seconds.**



12.1.2.6. Pull Up Lever

1. **After 40 seconds, pull up lever.**
   Solder iron catches removed RF unit by magnet inside of solder iron.

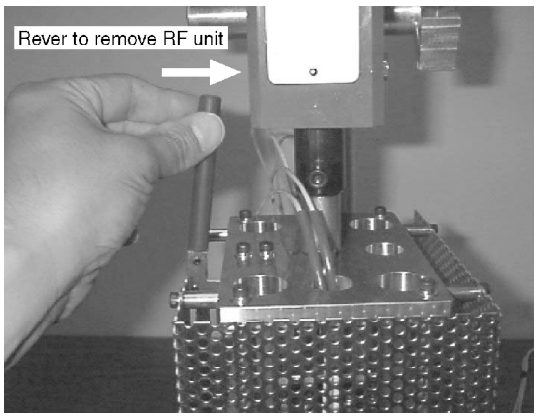


12.1.2.7. Remove PC Board and Fixture

Remove PC board and fixture from the stand of jig.

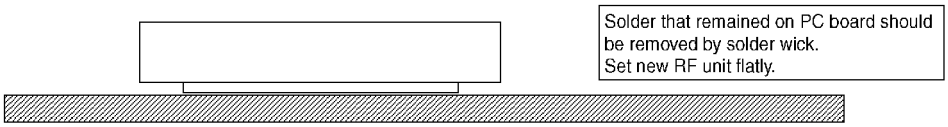
12.1.2.8. Push Lever to Remove RF Unit

1. **Push lever to the direction of picture to remove RF unit caught by magnet.**
2. **Because the dropped RF unit is very hot, pay attention to touch.**



12.1.2.9. Remove Unnecessary Solder on PC Board

1. **Remove unnecessary solder on PC board by solder wick.**



12.1.3. How to Solder the RF Unit (Base Unit)

There are 3 types of RF unit in the base unit produced in factory.

1. No spacer on the bottom of RF unit

2. A spacer is equipped on the bottom of RF unit. (Fig. 1)

3. 4 metal plates are equipped on the bottom of RF unit. (Fig. 2)

Every RF unit of above-mentioned type should be replaced with the one of part No. PQWPTG2000K (equipped with a spacer).

In case of 3., install a new RF unit after removing 4 metal plates.

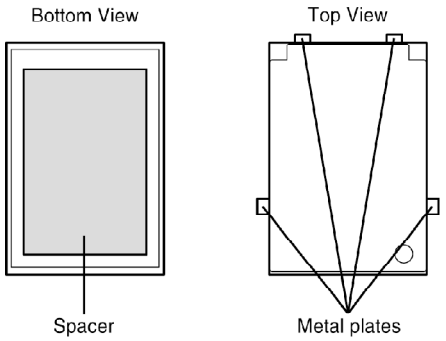
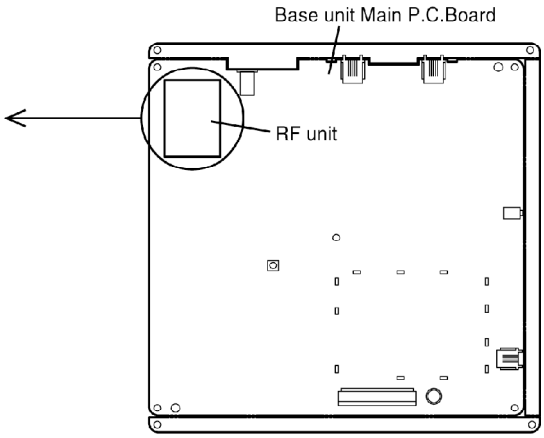


Fig.1

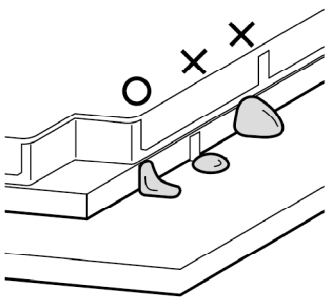
Fig.2



Soldering should be followed the conditions below.

Soldering iron	**HAKKO 907 24V 50W or the equivalent**
Adjustment temperature	**480°C (Adjustment dial is set to the maximum position.)**
Temperature of the Copper Rod	**430~440°C (Measured value)**
Working Time	**4 sec. a terminal (Enough time is required to melt the solder.)**

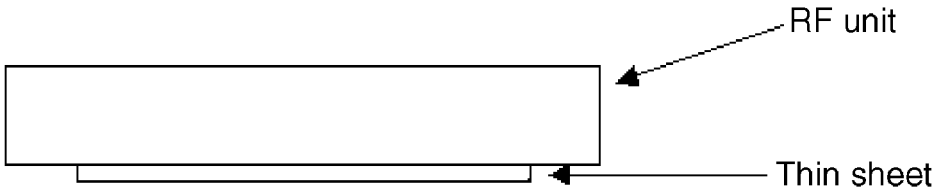
Be careful of the short or defect when soldering.



12.1.4. Solder

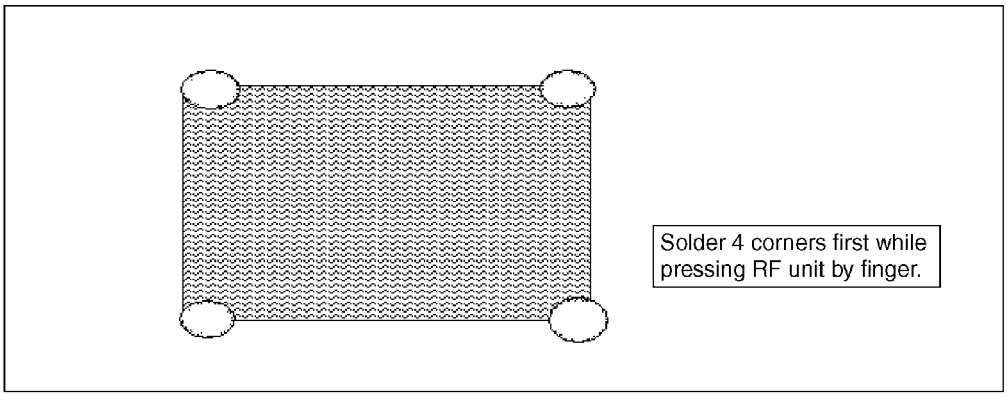
1. Put new RF unit on PC board.

RF unit for only base unit has sheet under RF unit to keep space between RF unit and PC board.
PC board of cordless handset bends a little at production process in factory. So no need to put metal plate or sheet to keep space between RF unit and PC board.

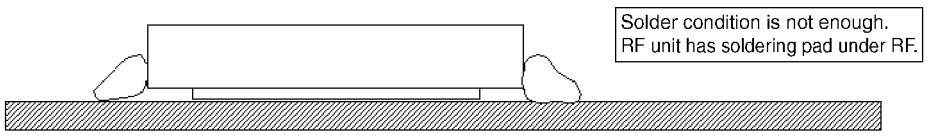


Thin sheet is sticked under RF unit to keep a space between RF unit and PC board.

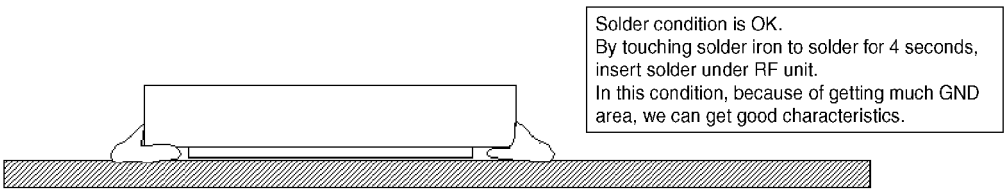
2. First solder 4 corners of RF unit while pressing RF unit.



(Bad solder)

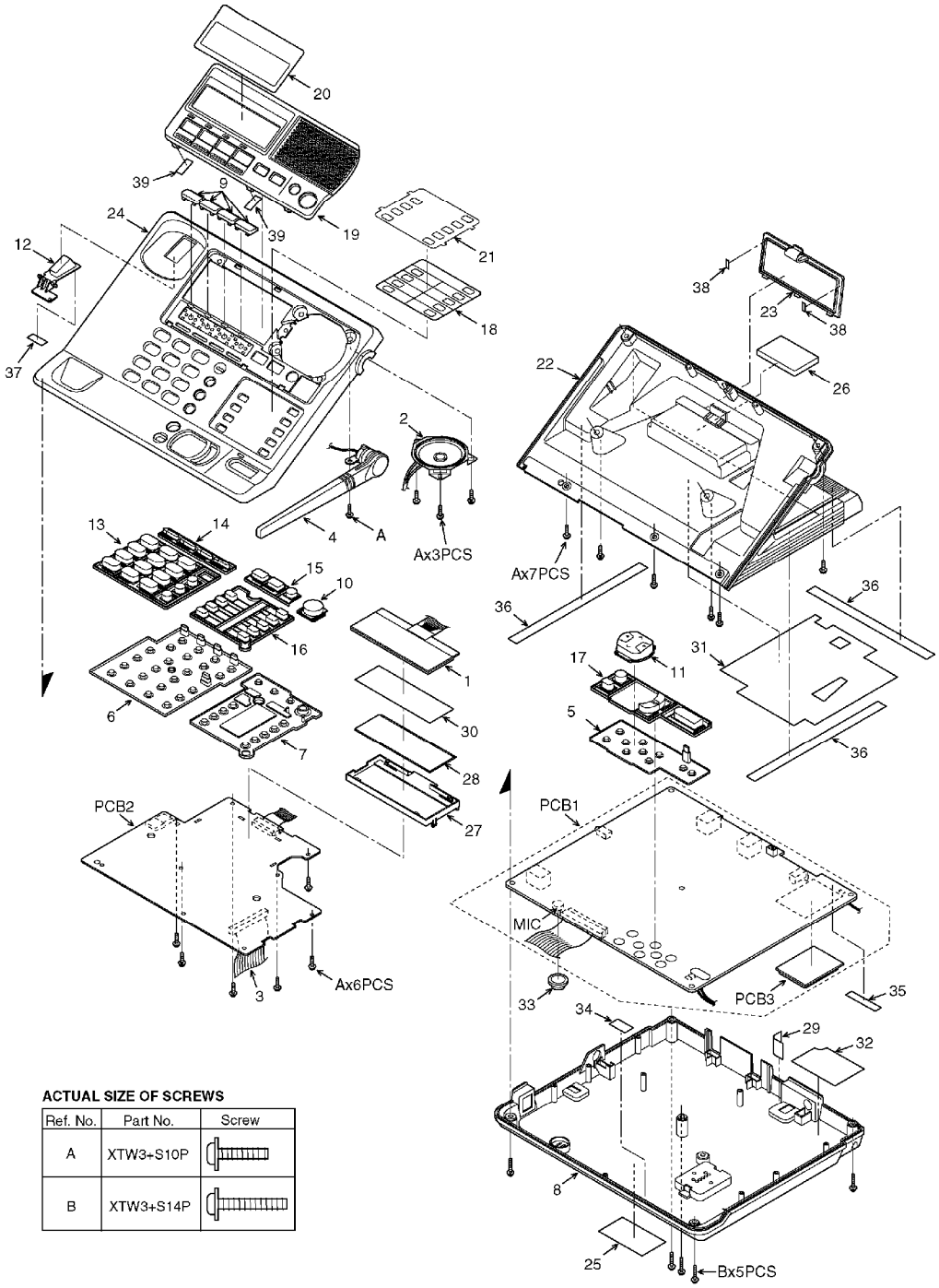


(Good solder)


Solder condition is OK.
By touching solder iron to solder for 4 seconds, insert solder under RF unit.
In this condition, because of getting much GND area, we can get good characteristics.

Solder all solder pads. / After replacing RF unit, RSSI should be adjusted by using dummy jig.

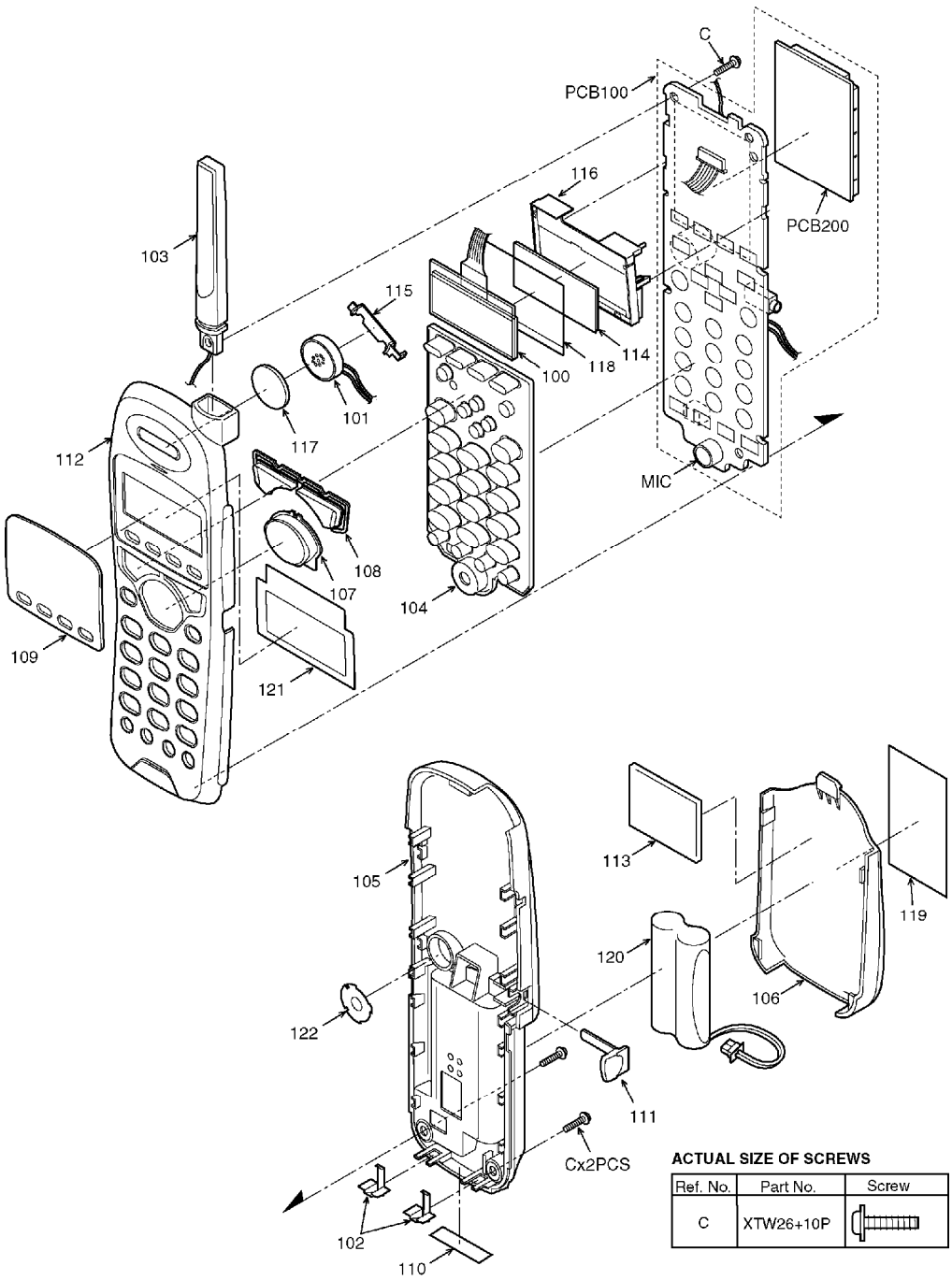
13. CABINET AND ELECTRICAL PARTS (Base Unit)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
A	XTW3+S10P	
B	XTW3+S14P	

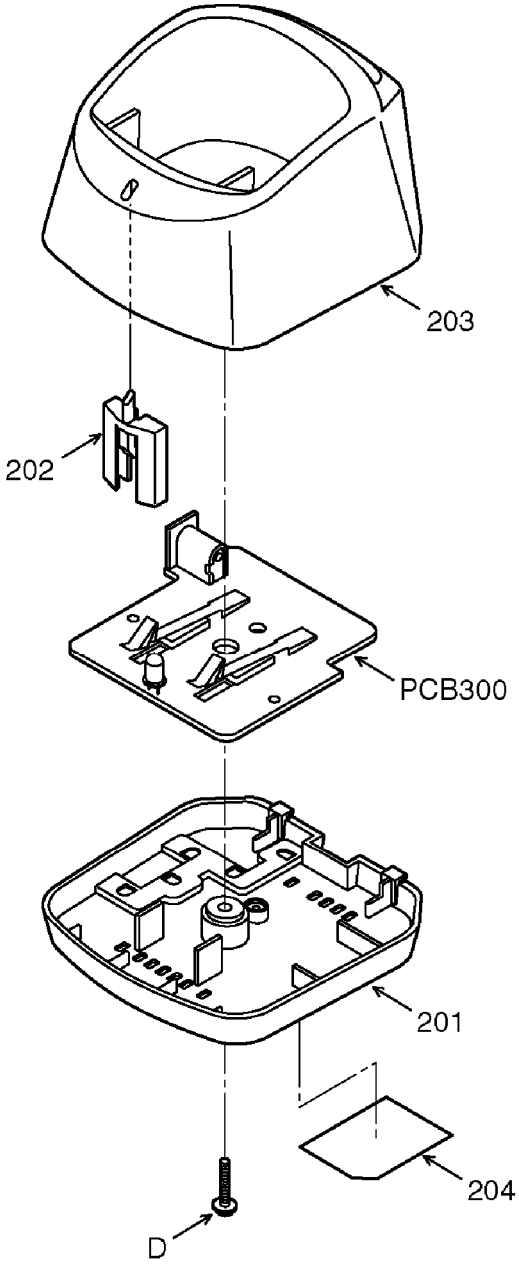
14. CABINET AND ELECTRICAL PARTS (Cordless Handset)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
C	XTW26+10P	

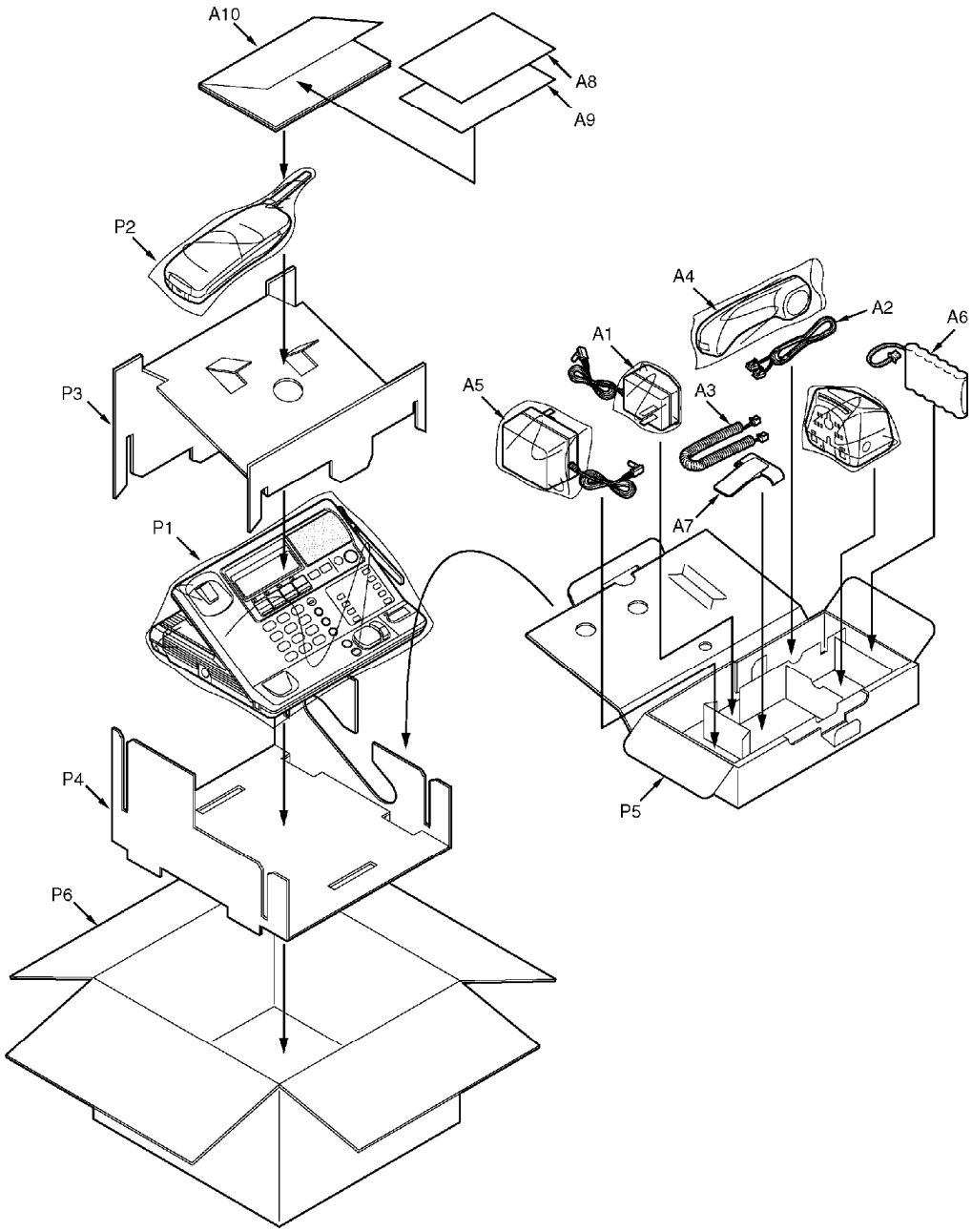
14.1. CABINET AND ELECTRICAL PARTS (Charger)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
D	XTW26+12P	

15. ACCESSORIES AND PACKING MATERIALS



16. REPLACEMENT PARTS LIST

This replacement parts list are U.S.A. version only.
Note:

1. RTL (Retention Time Limited)

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of

assembly, and in accordance with the laws governing part and product retention.
After the end of this period, the assembly will no longer be available.

2. **Important safety notice**
   Components identified by a ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark indicates service standard parts and may differ from production parts.**
4. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   ***Type & Wattage of Resistor**

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

16.1. Base Unit

16.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQADNCG097	LIQUID CRYSTAL DISPLAY	
2	PQAS57P03Y	SPEAKER	
3	PQJE10100Z	LEAD WIRE	
4	PQSA10098Z	ANTENNA	
5	PQSX10119Z	RUBBER SWITCH, NAVIGATOR	
6	PQSX10120Z	RUBBER SWITCH, 23KEY	
7	PQSX10121Z	RUBBER SWITCH, HANDSET SELECT	
8	PQYF10162X1	LOWER CABINET	S
9	PQBC10297Z1	BUTTON, LINE SELECT	S
10	PQBC10298Z1	BUTTON, VOICE MAIL	S
11	PQBC10299Z1	BUTTON, NAVIGATOR	S
12	PQBH10028Z1	BUTTON, HOOK	S
13	PQBX10330Z1	BUTTON, 15KEY	S
14	PQBX10331Z1	BUTTON, ANSWER ON	S
15	PQBX10332Z1	BUTTON, TAM	S
16	PQBX10333Z1	BUTTON, HANDSET SELECT	S
17	PQBX10334Z1	BUTTON, SP-PHONE	S
18	PQGD10160Z	TEL CARD	
19	PQGG10105Z1	GRILLE	S
20	PQGP10160Z1	LCD PANEL	S
21	PQGV10037Z	TEL CARD COVER	
22	PQKE10102Z1	REAR CABINET	S
23	PQKK10101Z1	BATTERY COVER	S
24	PQKM10420Z1	UPPER CABINET	S
25	PQGT14157Z	NAME PLATE	
26	PQHE10109Z	SPONGE, BATTERY COVER	
27	PQHR10730Z	LCD HOLDER	
28	PQHR10732Z	LCD REFLECTOR	
29	PQHS10438Z	INSULATOR	
30	PQHX10944Z	SMOKE SHEET	
31	PQHX10967Y	INSULATOR	
32	PQHX10977Z	INSULATOR	
33	PQMG10023Z	MIC COVER	
34	PQHS10365Z	HIMERON TAPE	
35	PQHS10192Z	HIMERON	
36	PQHS10447Z	HIMERON TAPE	
37	PQHS10442Z	HIMERON TAPE	
38	PQHS10449Z	HIMERON TAPE	
39	PQHS10442Z	HIMERON TAPE	

16.1.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1G4000BH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC101	PQVINJM2904F	IC	S
IC102	PQVINJM2904F	IC	S
IC103	PQVINJM3403V	IC	
IC104	PQVID6571F1	IC	
IC105	PQVITC7SZU04	IC	
IC201	PQVINJM2904F	IC	S
IC202	PQVINJM2904F	IC	S
IC203	PQVINJM3403V	IC	
IC204	PQVID6571F1	IC	
IC301	PQVINJM2904F	IC	S
IC302	PQVINJM2904F	IC	S
IC303	PQVINJM3403V	IC	
IC304	PQVID6571F1	IC	
IC401	PQVINJM2904F	IC	S
IC402	PQVINJM2904F	IC	S
IC403	PQVINJM3403V	IC	
IC404	PQVID6571F1	IC	
IC501	PQVINJM2360M	IC	
IC502	PQVIS8520F33	IC	
IC503	PQVILM1117MP	IC	
IC504	PQVILM1117MP	IC	
IC601	PQVIMX9300BI	IC	
IC602	PQVINJM2904F	IC	S
IC603	PQVINJM2904F	IC	S
IC701	PQVI2350F10	IC	
IC702	PQVIIFPS2134	IC	
IC703	PQWI3G4000HC	IC ASS'Y	S
IC704	PQVIV6310LTF	IC	
IC705	PQWI1G2000BH	IC ASS'Y	
IC801	PQVIXCD10499	IC	
IC803	PQVI24LC64IT	IC	S
IC805	PQVI2340FA10	IC	
IC806	PQWI2G2000HG	IC ASS'Y	S
IC807	PQVIV6325LTF	IC	
IC815	PQVIMC7101B5	IC	
IC816	PQVIMC7101B5	IC	
IC818	PQVIPMB4729T	IC	
IC819	PQVIPS3428UT	IC	
D802	PQVILM4040D2	IC	
		(TRANSISTORS)	
Q101	UN5213	TRANSISTOR(SI)	S
Q102	UN5213	TRANSISTOR(SI)	S
Q103	UN5213	TRANSISTOR(SI)	S
Q104	UN5213	TRANSISTOR(SI)	S
Q105	UN5113	TRANSISTOR(SI)	S
Q106	2SD1819A	TRANSISTOR(SI)	
Q107	2SA1625	TRANSISTOR(SI)	
Q201	UN5213	TRANSISTOR(SI)	S
Q202	UN5213	TRANSISTOR(SI)	S
Q203	UN5213	TRANSISTOR(SI)	S
Q204	UN5213	TRANSISTOR(SI)	S
Q205	UN5113	TRANSISTOR(SI)	S

Ref. No.	Part No.	Part Name & Description	Remarks
Q206	2SD1819A	TRANSISTOR(SI)	
Q207	2SA1625	TRANSISTOR(SI)	
Q301	UN5213	TRANSISTOR(SI)	S
Q302	UN5213	TRANSISTOR(SI)	S
Q303	UN5213	TRANSISTOR(SI)	S
Q304	UN5213	TRANSISTOR(SI)	S
Q305	UN5113	TRANSISTOR(SI)	S
Q306	2SD1819A	TRANSISTOR(SI)	
Q307	2SA1625	TRANSISTOR(SI)	
Q401	UN5213	TRANSISTOR(SI)	S
Q402	UN5213	TRANSISTOR(SI)	S
Q403	UN5213	TRANSISTOR(SI)	S
Q404	UN5213	TRANSISTOR(SI)	S
Q405	UN5113	TRANSISTOR(SI)	S
Q406	2SD1819A	TRANSISTOR(SI)	
Q407	2SA1625	TRANSISTOR(SI)	
Q501	2SJ525TP	TRANSISTOR(SI)	
Q502	2SJ507TPE6	TRANSISTOR(SI)	
Q503	2SA933	TRANSISTOR(SI)	
Q505	UN5113	TRANSISTOR(SI)	S
Q506	2SD1819A	TRANSISTOR(SI)	
Q507	2SJ507TPE6	TRANSISTOR(SI)	
Q508	2SJ525TP	TRANSISTOR(SI)	
Q509	2SD1991A	TRANSISTOR(SI)	
Q510	2SA933	TRANSISTOR(SI)	
Q511	2SA933	TRANSISTOR(SI)	
Q512	2SA933	TRANSISTOR(SI)	
Q513	2SD1819A	TRANSISTOR(SI)	
Q514	2SD1819A	TRANSISTOR(SI)	
Q515	2SD1819A	TRANSISTOR(SI)	
Q516	2SD1819A	TRANSISTOR(SI)	
Q517	2SA933	TRANSISTOR(SI)	
Q518	2SD1819A	TRANSISTOR(SI)	
Q519	2SD1819A	TRANSISTOR(SI)	
Q520	2SD1819A	TRANSISTOR(SI)	
Q521	2SD1819A	TRANSISTOR(SI)	
Q522	2SD1819A	TRANSISTOR(SI)	
Q523	2SD1819A	TRANSISTOR(SI)	
Q524	UN5213	TRANSISTOR(SI)	S
Q525	2SD1994A	TRANSISTOR(SI)	
Q526	UN5213	TRANSISTOR(SI)	S
Q527	UN5213	TRANSISTOR(SI)	S
Q601	2SD1819A	TRANSISTOR(SI)	
Q602	UN5213	TRANSISTOR(SI)	S
Q603	2SD1819A	TRANSISTOR(SI)	
Q604	UN5213	TRANSISTOR(SI)	S
Q605	2SD1819A	TRANSISTOR(SI)	
Q606	UN5213	TRANSISTOR(SI)	S
Q607	UN5213	TRANSISTOR(SI)	S
Q803	2SD1819A	TRANSISTOR(SI)	
Q805	2SD1819A	TRANSISTOR(SI)	
Q806	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D101	PQVDS1ZB60F1	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D102	MA153	DIODE(SI)	
D103	MA153	DIODE(SI)	
D106	MA111	DIODE(SI)	
D107	MA111	DIODE(SI)	
D109	MA4220	DIODE(SI)	
D201	PQVDS1ZB60F1	DIODE(SI)	
D202	MA153	DIODE(SI)	
D203	MA153	DIODE(SI)	
D206	MA111	DIODE(SI)	
D207	MA111	DIODE(SI)	
D209	MA4220	DIODE(SI)	
D301	PQVDS1ZB60F1	DIODE(SI)	
D302	MA153	DIODE(SI)	
D303	MA153	DIODE(SI)	
D306	MA111	DIODE(SI)	
D307	MA111	DIODE(SI)	
D309	MA4220	DIODE(SI)	
D401	PQVDS1ZB60F1	DIODE(SI)	
D402	MA153	DIODE(SI)	
D403	MA153	DIODE(SI)	
D406	MA111	DIODE(SI)	
D407	MA111	DIODE(SI)	
D409	MA4220	DIODE(SI)	
D501	PQVDSS24	DIODE(SI)	
D502	PQVDS5688G	DIODE(SI)	
D503	PQVDS5688G	DIODE(SI)	
D505	PQVDSS24	DIODE(SI)	
D507	MA4300	DIODE(SI)	
D508	MA4300	DIODE(SI)	
D516	MA8047	DIODE(SI)	
D517	MA8047	DIODE(SI)	
D518	MA8047	DIODE(SI)	
D510	1SS119	DIODE(SI)	
D511	1SS119	DIODE(SI)	
D512	1SS119	DIODE(SI)	
D513	PQVDS5688G	DIODE(SI)	
D514	MA4047	DIODE(SI)	
D515	MA4047	DIODE(SI)	
D520	MA4068	DIODE(SI)	
D522	PQVDSS24	DIODE(SI)	
D523	1SS119	DIODE(SI)	
D601	1SS119	DIODE(SI)	
D602	MA153	DIODE(SI)	
D603	MA153	DIODE(SI)	
D605	MA4068	DIODE(SI)	
D606	MA4068	DIODE(SI)	
D607	1SS119	DIODE(SI)	
D608	MA153	DIODE(SI)	
D609	MA153	DIODE(SI)	
D615	MA8051	DIODE(SI)	
D803	PQVDHRU0203A	DIODE(SI)	
D811	MA153	DIODE(SI)	
D812	PQVDBAS16	DIODE(SI)	
D814	PQVDBB639	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D815	MA111	DIODE(SI)	
D816	MA111	DIODE(SI)	
D817	MA111	DIODE(SI)	
		(COMPONENTS COMBINATION)	
RA101	EXRV8V681JV	RESISTOR ARRAY, 680	
RA102	EXRV8V681JV	RESISTOR ARRAY, 680	
RA103	EXRV8V681JV	RESISTOR ARRAY, 680	
RA201	EXRV8V681JV	RESISTOR ARRAY, 680	
RA202	EXRV8V681JV	RESISTOR ARRAY, 680	
RA203	EXRV8V681JV	RESISTOR ARRAY, 680	
RA301	EXRV8V681JV	RESISTOR ARRAY, 680	
RA302	EXRV8V681JV	RESISTOR ARRAY, 680	
RA303	EXRV8V681JV	RESISTOR ARRAY, 680	
RA401	EXRV8V681JV	RESISTOR ARRAY, 680	
RA402	EXRV8V681JV	RESISTOR ARRAY, 680	
RA403	EXRV8V681JV	RESISTOR ARRAY, 680	
RA701	EXRV8V222JV	RESISTOR ARRAY, 2.2k	
RA702	EXRV8V471JV	RESISTOR ARRAY, 470	
RA704	EXRV8V222JV	RESISTOR ARRAY, 2.2k	
RA705	EXRV8V222JV	RESISTOR ARRAY, 2.2k	
RA706	EXRV8V222JV	RESISTOR ARRAY, 2.2k	
RA707	EXRV8V473JV	RESISTOR ARRAY, 47k	
RA708	EXRV8V473JV	RESISTOR ARRAY, 47k	
		(CONNECTORS)	
CN15	PQJS34B27Z	CONNECTOR	
CN19	PQJP2D13Z	CONNECTOR	
		(CRYSTAL OSCILLATORS)	
X101	PQVCJ4096N5Z	CRYSTAL OSCILLATOR	
X801	PQVCJ1000N4Z	CRYSTAL OSCILLATOR	
X802	PQVCF1036N6Z	CRYSTAL OSCILLATOR	
		(COILS)	
L101	PQLQXF100K	COIL	
L102	PQLQXF100K	COIL	
L201	PQLQXF100K	COIL	
L202	PQLQXF100K	COIL	
L301	PQLQXF100K	COIL	
L302	PQLQXF100K	COIL	
L401	PQLQXF100K	COIL	
L402	PQLQXF100K	COIL	
L501	PQLQXH330K	COIL	
L502	PQLQXH330K	COIL	
L503	PQLE139	COIL	
L505	PQLE140	COIL	
L506	PQLQXH330K	COIL	
L508	ELEV220KA	COIL	
L509	PQLQR1ET	COIL	
L600	PQLQZM4R7K	COIL	
L601	PQLQZM101K	COIL	
L602	PQLQZM101K	COIL	
L607	PQLQXF100K	COIL	
L608	PQLQXF100K	COIL	
L801	PQLQR1U101K	COIL	
L802	PQLQR1U101K	COIL	
		(JACKS)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN6	PQJJ1C002Z	JACK, HEADSET	
CN9	PQJJ1B4Y	JACK, DC	
CN10	PQJJ1TB18Z	JACK, HANDSET	
CN13	PQJJ1TB26Z	JACK, TEL LINE 3, LINE 4	
CN14	PQJJ1TB26Z	JACK, TEL LINE 1, LINE 2	
		(LED)	
LED701	LNJ211R8ARU	LED	
		(PHOTO ELECTRIC TRANSDUCERS)	
PC101	0N3181	PHOTO ELECTRIC TRANSDUCER	
PC102	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S
PC201	0N3181	PHOTO ELECTRIC TRANSDUCER	
PC202	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S
PC301	0N3181	PHOTO ELECTRIC TRANSDUCER	
PC302	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S
PC401	0N3181	PHOTO ELECTRIC TRANSDUCER	
PC402	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S
		(POSISTORS)	
PO101	PQRPAR390N	POSISTOR	S
PO201	PQRPAR390N	POSISTOR	S
PO301	PQRPAR390N	POSISTOR	S
PO401	PQRPAR390N	POSISTOR	S
		(SWITCH)	
SW501	EVQ21005G	SPECIAL SWITCH, RESET	
		(TRANSFORMES)	
T101	PQLT8E8A	TRANSFORMER	
T201	PQLT8E9A	TRANSFORMER	
T301	PQLT8E8A	TRANSFORMER	
T401	PQLT8E9A	TRANSFORMER	
		(VARISTORS)	
SA101	PQVDDSS301L	VARISTOR	
SA102	PQVDDSS301L	VARISTOR	
SA201	PQVDDSS301L	VARISTOR	
SA202	PQVDDSS301L	VARISTOR	
SA301	PQVDDSS301L	VARISTOR	
SA302	PQVDDSS301L	VARISTOR	
SA401	PQVDDSS301L	VARISTOR	
SA402	PQVDDSS301L	VARISTOR	
		(OTHER)	
MIC	PQJM122Z	MICROPHONE	
		(RESISTORS)	
R101	ERDS2TJ220	22	
R102	ERDS2TJ473	47k	
R103	ERJ3GEYJ225	2.2M	
R104	ERJ3GEYJ564	560k	
R105	ERJ3GEYJ225	2.2M	
R106	ERJ3GEYJ564	560k	
R107	ERJ3GEYJ683	68k	
R108	ERJ3GEYJ394	390k	
R109	ERJ3GEYJ394	390k	
R110	ERJ3GEYJ335	3.3M	
R111	ERJ3GEYJ473	47k	
R112	ERJ3GEYJ473	47k	
R113	ERJ3GEYJ683	68k	
R114	ERJ3GEYJ335	3.3M	

Ref. No.	Part No.	Part Name & Description	Remarks
R115	ERJ3GEYJ104	100k	
R116	ERJ3GEYJ103	10k	
R117	PQ4R10XJ106	10M	S
R118	PQ4R10XJ000	0	S
R119	ERJ8GEYF825	8.2M	
R120	ERJ8GEYF825	8.2M	
R121	ERJ3GEYJ824	820k	
R122	ERJ3GEYJ824	820k	
R123	ERJ3GEYJ104	100k	
R124	ERJ3GEYJ273	27k	
R125	ERJ3GEYJ473	47k	
R126	ERJ3GEYJ122	1.2k	
R127	ERJ3GEYJ473	47k	
R128	ERJ3GEYJ563	56k	
R129	ERJ3GEYJ102	1k	
R130	ERJ3GEYJ562	5.6k	
R131	ERJ3GEYJ102	1k	
R132	ERJ3GEYJ472	4.7k	
R133	ERJ3GEYJ473	47k	
R134	ERJ3GEYJ103	10k	
R135	ERJ3GEYJ221	220	
R138	ERJ3GEYJ221	220	
R139	ERJ3GEYJ104	100k	
R140	ERJ3GEYJ104	100k	
R141	ERJ3GEYJ103	10k	
R142	ERJ3GEYJ103	10k	
R144	ERJ3GEYJ393	39k	
R145	ERJ3GEYJ103	10k	
R146	ERJ3GEYJ393	39k	
R148	ERJ3GEYJ473	47k	
R149	ERJ3GEYJ332	3.3k	
R150	ERJ3GEYJ182	1.8k	
R151	ERJ3GEYJ103	10k	
R152	ERJ3GEY0R00	0	
R153	ERJ3GEYJ223	22k	
R154	ERJ3GEYJ122	1.2k	
R155	ERJ3GEYJ105	1M	
R156	ERJ3GEYJ103	10k	
R158	ERJ3GEYJ104	100k	
R159	ERJ3GEYJ103	10k	
R160	ERJ3GEYJ103	10k	
R161	ERJ3GEYJ153	15k	
R162	ERJ3GEYJ103	10k	
R163	ERJ3GEYJ103	10k	
R164	ERJ3GEYJ471	470	
R165	PQRDSF1VJ820	82	
R166	PQRDSF1VJ820	82	
R169	ERJ3GEYJ393	39k	
R171	ERJ3GEYJ182	1.8k	
R181	ERJ3GEYJ221	220	
R182	ERJ3GEYJ102	1k	
R183	ERJ3GEYJ105	1M	
R184	ERJ3GEYJ181	180	
R185	ERJ3GEYJ104	100k	

Ref. No.	Part No.	Part Name & Description	Remarks
R186	ERJ3GEYJ100	10	
R187	PQ4R10XJ104	100k	S
R188	ERDS2TJ472	4.7k	
R190	ERJ3GEYJ105	1M	
R201	ERDS2TJ220	22	
R202	ERDS2TJ473	47k	
R203	ERJ3GEYJ225	2.2M	
R204	ERJ3GEYJ564	560k	
R205	ERJ3GEYJ225	2.2M	
R206	ERJ3GEYJ564	560k	
R207	ERJ3GEYJ683	68k	
R208	ERJ3GEYJ394	390k	
R209	ERJ3GEYJ394	390k	
R210	ERJ3GEYJ335	3.3M	
R211	ERJ3GEYJ473	47k	
R212	ERJ3GEYJ473	47k	
R213	ERJ3GEYJ683	68k	
R214	ERJ3GEYJ335	3.3M	
R215	ERJ3GEYJ104	100k	
R216	ERJ3GEYJ103	10k	
R217	PQ4R10XJ106	10M	S
R218	PQ4R10XJ000	0	S
R219	ERJ8GEYF825	8.2M	
R220	ERJ8GEYF825	8.2M	
R221	ERJ3GEYJ824	820k	
R222	ERJ3GEYJ824	820k	
R223	ERJ3GEYJ104	100k	
R224	ERJ3GEYJ273	27k	
R225	ERJ3GEYJ473	47k	
R226	ERJ3GEYJ122	1.2k	
R227	ERJ3GEYJ473	47k	
R228	ERJ3GEYJ563	56k	
R229	ERJ3GEYJ102	1k	
R230	ERJ3GEYJ562	5.6k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ472	4.7k	
R233	ERJ3GEYJ473	47k	
R234	ERJ3GEYJ103	10k	
R235	ERJ3GEYJ221	220	
R238	ERJ3GEYJ221	220	
R239	ERJ3GEYJ104	100k	
R240	ERJ3GEYJ104	100k	
R241	ERJ3GEYJ103	10k	
R242	ERJ3GEYJ103	10k	
R244	ERJ3GEYJ393	39k	
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ393	39k	
R248	ERJ3GEYJ473	47k	
R249	ERJ3GEYJ332	3.3k	
R250	ERJ3GEYJ182	1.8k	
R251	ERJ3GEYJ103	10k	
R252	ERJ3GEY0R00	0	
R253	ERJ3GEYJ223	22k	
R254	ERJ3GEYJ122	1.2k	

Ref. No.	Part No.	Part Name & Description	Remarks
R255	ERJ3GEYJ105	1M	
R256	ERJ3GEYJ103	10k	
R258	ERJ3GEYJ104	100k	
R259	ERJ3GEYJ103	10k	
R260	ERJ3GEYJ103	10k	
R261	ERJ3GEYJ153	15k	
R262	ERJ3GEYJ103	10k	
R263	ERJ3GEYJ103	10k	
R264	ERJ3GEYJ471	470	
R265	PQRDSF1VJ820	82	
R266	PQRDSF1VJ820	82	
R269	ERJ3GEYJ393	39k	
R271	ERJ3GEYJ182	1.8k	
R281	ERJ3GEYJ221	220	
R282	ERJ3GEYJ102	1k	
R285	ERJ3GEYJ104	100k	
R287	PQ4R10XJ104	100k	S
R288	ERDS2TJ472	4.7k	
R301	ERDS2TJ220	22	
R302	ERDS2TJ473	47k	
R303	ERJ3GEYJ225	2.2M	
R304	ERJ3GEYJ564	560k	
R305	ERJ3GEYJ225	2.2M	
R306	ERJ3GEYJ564	560k	
R307	ERJ3GEYJ683	68k	
R308	ERJ3GEYJ394	390k	
R309	ERJ3GEYJ394	390k	
R310	ERJ3GEYJ335	3.3M	
R311	ERJ3GEYJ473	47k	
R312	ERJ3GEYJ473	47k	
R313	ERJ3GEYJ683	68k	
R314	ERJ3GEYJ335	3.3M	
R315	ERJ3GEYJ104	100k	
R316	ERJ3GEYJ103	10k	
R317	PQ4R10XJ106	10M	S
R318	PQ4R10XJ000	0	S
R319	ERJ8GEYF825	8.2M	
R320	ERJ8GEYF825	8.2M	
R321	ERJ3GEYJ824	820k	
R322	ERJ3GEYJ824	820k	
R323	ERJ3GEYJ104	100k	
R324	ERJ3GEYJ273	27k	
R325	ERJ3GEYJ473	47k	
R326	ERJ3GEYJ122	1.2k	
R327	ERJ3GEYJ473	47k	
R328	ERJ3GEYJ563	56k	
R329	ERJ3GEYJ102	1k	
R330	ERJ3GEYJ562	5.6k	
R331	ERJ3GEYJ102	1k	
R332	ERJ3GEYJ472	4.7k	
R333	ERJ3GEYJ473	47k	
R334	ERJ3GEYJ103	10k	
R335	ERJ3GEYJ221	220	
R338	ERJ3GEYJ221	220	

Ref. No.	Part No.	Part Name & Description	Remarks
R339	ERJ3GEYJ104	100k	
R340	ERJ3GEYJ104	100k	
R341	ERJ3GEYJ103	10k	
R342	ERJ3GEYJ103	10k	
R344	ERJ3GEYJ393	39k	
R345	ERJ3GEYJ103	10k	
R346	ERJ3GEYJ393	39k	
R348	ERJ3GEYJ473	47k	
R349	ERJ3GEYJ332	3.3k	
R350	ERJ3GEYJ182	1.8k	
R351	ERJ3GEYJ103	10k	
R352	ERJ3GEY0R00	0	
R353	ERJ3GEYJ223	22k	
R354	ERJ3GEYJ122	1.2k	
R355	ERJ3GEYJ105	1M	
R356	ERJ3GEYJ103	10k	
R358	ERJ3GEYJ104	100k	
R359	ERJ3GEYJ103	10k	
R360	ERJ3GEYJ103	10k	
R361	ERJ3GEYJ153	15k	
R362	ERJ3GEYJ103	10k	
R363	ERJ3GEYJ103	10k	
R364	ERJ3GEYJ471	470	
R365	PQRDSF1VJ820	82	
R366	PQRDSF1VJ820	82	
R369	ERJ3GEYJ393	39k	
R371	ERJ3GEYJ182	1.8k	
R381	ERJ3GEYJ221	220	
R382	ERJ3GEYJ102	1k	
R385	ERJ3GEYJ104	100k	
R387	PQ4R10XJ104	100k	S
R388	ERDS2TJ472	4.7k	
R401	ERDS2TJ220	22	
R402	ERDS2TJ473	47k	
R403	ERJ3GEYJ225	2.2M	
R404	ERJ3GEYJ564	560k	
R405	ERJ3GEYJ225	2.2M	
R406	ERJ3GEYJ564	560k	
R407	ERJ3GEYJ683	68k	
R408	ERJ3GEYJ394	390k	
R409	ERJ3GEYJ394	390k	
R410	ERJ3GEYJ335	3.3M	
R411	ERJ3GEYJ473	47k	
R412	ERJ3GEYJ473	47k	
R413	ERJ3GEYJ683	68k	
R414	ERJ3GEYJ335	3.3M	
R415	ERJ3GEYJ104	100k	
R416	ERJ3GEYJ103	10k	
R417	PQ4R10XJ106	10M	S
R418	PQ4R10XJ000	0	S
R419	ERJ8GEYF825	8.2M	
R420	ERJ8GEYF825	8.2M	
R421	ERJ3GEYJ824	820k	
R422	ERJ3GEYJ824	820k	

Ref. No.	Part No.	Part Name & Description	Remarks
R423	ERJ3GEYJ104	100k	
R424	ERJ3GEYJ273	27k	
R425	ERJ3GEYJ473	47k	
R426	ERJ3GEYJ122	1.2k	
R427	ERJ3GEYJ473	47k	
R428	ERJ3GEYJ563	56k	
R429	ERJ3GEYJ102	1k	
R430	ERJ3GEYJ562	5.6k	
R431	ERJ3GEYJ102	1k	
R432	ERJ3GEYJ472	4.7k	
R433	ERJ3GEYJ473	47k	
R434	ERJ3GEYJ103	10k	
R435	ERJ3GEYJ221	220	
R438	ERJ3GEYJ221	220	
R439	ERJ3GEYJ104	100k	
R440	ERJ3GEYJ104	100k	
R441	ERJ3GEYJ103	10k	
R442	ERJ3GEYJ103	10k	
R444	ERJ3GEYJ393	39k	
R445	ERJ3GEYJ103	10k	
R446	ERJ3GEYJ393	39k	
R448	ERJ3GEYJ473	47k	
R449	ERJ3GEYJ332	3.3k	
R450	ERJ3GEYJ182	1.8k	
R451	ERJ3GEYJ103	10k	
R452	ERJ3GEY0R00	0	
R453	ERJ3GEYJ223	22k	
R454	ERJ3GEYJ122	1.2k	
R455	ERJ3GEYJ105	1M	
R456	ERJ3GEYJ103	10k	
R458	ERJ3GEYJ104	100k	
R459	ERJ3GEYJ103	10k	
R460	ERJ3GEYJ103	10k	
R461	ERJ3GEYJ153	15k	
R462	ERJ3GEYJ103	10k	
R463	ERJ3GEYJ103	10k	
R464	ERJ3GEYJ471	470	
R465	PQRDSF1VJ820	82	
R466	PQRDSF1VJ820	82	
R469	ERJ3GEYJ393	39k	
R471	ERJ3GEYJ182	1.8k	
R481	ERJ3GEYJ221	220	
R482	ERJ3GEYJ102	1k	
R485	ERJ3GEYJ104	100k	
R487	PQ4R10XJ104	100k	S
R488	ERDS2TJ472	4.7k	
R501	ERDS2TJ331	330	
R502	ERJ3GEYJ102	1k	
R503	ERJ3GEYF123	12k	
R504	ERJ3GEYF473	47k	
R505	ERJ3GEYF103	10k	
R506	ERJ3GEYJ121	120	
R507	ERJ3GEYJ221	220	
R508	ERDS2TJ103	10k	

Ref. No.	Part No.	Part Name & Description	Remarks
R509	ERDS2TJ103	10k	
R510	ERX1SJR15	0.15	
R517	ERJ3GEYJ103	10k	
R518	ERJ3GEYJ472	4.7k	
R519	ERJ3GEYJ104	100k	
R521	ERDS2TJ102	1k	
R522	ERJ3GEYJ101	100	
R526	PQ4R10XJ331	330	S
R527	ERDS2TJ103	10k	
R528	ERDS2TJ103	10k	
R529	ERDS2TJ103	10k	
R530	PQ4R10XJ331	330	S
R531	PQ4R10XJ103	10k	S
R532	PQ4R10XJ331	330	S
R533	PQ4R10XJ103	10k	S
R534	PQ4R10XJ331	330	S
R535	PQ4R10XJ331	330	S
R536	ERDS2TJ103	10k	
R537	PQ4R10XJ331	330	S
R538	PQ4R10XJ331	330	S
R539	PQ4R10XJ331	330	S
R540	PQ4R10XJ103	10k	S
R541	PQ4R10XJ103	10k	S
R542	PQ4R10XJ103	10k	S
R543	PQ4R10XJ331	330	S
R544	PQ4R10XJ331	330	S
R546	ERJ3GEYJ332	3.3k	
R547	ERJ3GEYF223	22k	
R548	ERJ3GEYF103	10k	
R549	ERJ3GEYJ101	100	
R550	ERJ3GEYJ331	330	
R551	ERJ3GEYJ180	18	
R552	ERJ3GEYJ562	5.6k	
R553	ERJ3GEYJ150	15	
R557	PQ4R10XJ120	12	S
R558	ERJ3GEYJ273	27k	
R559	ERJ3GEYJ103	10k	
R601	ERJ3GEYJ103	10k	
R602	ERJ3GEYJ822	8.2k	
R603	ERJ3GEYJ822	8.2k	
R604	ERJ3GEYJ102	1k	
R605	ERJ3GEYJ102	1k	
R606	ERJ3GEYJ102	1k	
R607	ERJ3GEYJ394	390k	
R608	ERJ3GEYJ103	10k	
R609	ERJ3GEYJ333	33k	
R610	ERJ3GEYJ473	47k	
R611	ERJ3GEYJ103	10k	
R612	ERJ3GEYJ334	330k	
R613	ERJ3GEYJ334	330k	
R614	ERJ3GEYJ472	4.7k	
R615	ERJ3GEY0R00	0	
R616	ERJ3GEY0R00	0	
R617	ERJ3GEYJ222	2.2k	

Ref. No.	Part No.	Part Name & Description	Remarks
R618	ERJ3GEYJ222	2.2k	
R619	ERJ3GEYJ332	3.3k	
R620	ERJ3GEYJ222	2.2k	
R621	ERJ3GEYJ334	330k	
R622	ERJ3GEYJ334	330k	
R623	ERJ3GEYJ124	120k	
R624	ERJ3GEYJ124	120k	
R625	ERJ3GEY0R00	0	
R626	ERJ3GEY0R00	0	
R627	ERJ3GEY0R00	0	
R628	ERJ3GEYJ182	1.8k	
R629	ERJ3GEYJ221	220	
R630	ERJ3GEYJ222	2.2k	
R631	ERJ3GEYJ221	220	
R632	ERJ3GEYJ182	1.8k	
R633	ERJ3GEYJ332	3.3k	
R634	ERJ3GEYJ102	1k	
R635	ERJ3GEYJ104	100k	
R636	ERJ3GEYJ222	2.2k	
R637	ERJ3GEYJ332	3.3k	
R638	ERJ3GEYJ473	47k	
R639	ERJ3GEYJ102	1k	
R640	ERJ3GEYJ473	47k	
R641	ERJ3GEYJ102	1k	
R642	ERJ3GEYJ102	1k	
R643	ERJ3GEYJ102	1k	
R644	ERJ3GEYJ102	1k	
R645	ERJ3GEYJ123	12k	
R646	ERJ3GEYJ123	12k	
R647	ERJ3GEYJ472	4.7k	
R648	ERJ3GEYJ472	4.7k	
R649	ERJ3GEYJ472	4.7k	
R650	ERJ3GEYJ472	4.7k	
R651	ERJ3GEYJ104	100k	
R652	ERJ3GEYJ102	1k	
R653	ERJ3GEYJ681	680	
R654	ERJ3GEYJ181	180	
R701	ERJ3GEYJ222	2.2k	
R702	ERJ3GEYJ103	10k	
R703	ERJ3GEYJ102	1k	
R704	ERJ3GEYJ332	3.3k	
R705	ERJ3GEYJ102	1k	
R706	ERJ3GEYJ222	2.2k	
R707	ERJ3GEYJ102	1k	
R708	ERJ3GEYJ473	47k	
R711	ERJ3GEYJ473	47k	
R712	ERJ3GEYJ473	47k	
R713	ERJ3GEYJ473	47k	
R715	ERJ3GEYJ473	47k	
R716	ERJ3GEYJ473	47k	
R717	ERJ3GEYJ473	47k	
R718	ERJ3GEYJ473	47k	
R719	ERJ3GEYJ473	47k	
R720	ERJ3GEYJ473	47k	

Ref. No.	Part No.	Part Name & Description	Remarks
R721	ERJ3GEYJ473	47k	
R723	ERJ3GEYJ473	47k	
R724	ERJ3GEYJ104	100k	
R725	ERJ3GEYJ222	2.2k	
R726	ERJ3GEYJ561	560	
R727	ERJ3GEY0R00	0	
R728	ERJ3GEYJ561	560	
R729	ERJ3GEYJ222	2.2k	
R730	ERJ3GEYJ222	2.2k	
R731	ERJ3GEYJ391	390	
R732	ERJ3GEYJ391	390	
R733	ERJ3GEYJ391	390	
R734	ERJ3GEYJ391	390	
R736	ERJ8GEYJ391	390	
R737	ERJ3GEYJ104	100k	
R738	ERJ3GEYJ104	100k	
R740	ERJ3GEYJ102	1k	
R741	ERJ3GEYJ222	2.2k	
R742	ERJ3GEYJ222	2.2k	
R743	ERJ3GEYJ104	100k	
R744	ERJ3GEYJ103	10k	
R755	ERJ3GEYJ104	100k	
R756	ERJ3GEYJ473	47k	
R758	ERJ3GEYJ561	560	
R759	ERJ3GEYJ102	1k	
R760	ERJ3GEYJ102	1k	
R761	ERJ3GEYJ102	1k	
R763	ERJ3GEYJ561	560	
R764	ERJ3GEYJ561	560	
R765	ERJ3GEYJ104	100k	
R767	ERJ3GEYJ123	12k	
R803	ERJ3GEYJ104	100k	
R806	ERJ3GEYJ102	1k	
R809	ERJ3GEYJ474	470k	
R813	ERJ3GEYJ474	470k	
R816	ERJ3GEYJ473	47k	
R817	ERJ3GEYJ103	10k	
R818	ERJ3GEYJ472	4.7k	
R819	ERJ3GEYJ103	10k	
R820	ERJ3GEYJ151	150	
R821	ERJ3GEYJ103	10k	
R827	ERJ3GEYJ102	1k	
R828	ERJ3GEYJ102	1k	
R829	ERJ3GEYJ104	100k	
R830	ERJ3GEYJ104	100k	
R831	ERJ3GEYJ103	10k	
R832	ERJ3GEYJ330	33	
R833	ERJ3GEYJ103	10k	
R834	ERJ3GEYJ103	10k	
R835	ERJ3GEYJ103	10k	
R836	ERJ3GEYJ330	33	
R837	ERJ3GEYJ101	100	
R838	ERJ3GEYJ104	100k	
R839	ERJ3GEYJ102	1k	

Ref. No.	Part No.	Part Name & Description	Remarks
R840	ERJ3GEYJ102	1k	
R842	ERJ3GEYJ103	10k	
R843	ERJ3GEYJ103	10k	
R844	ERJ3GEYJ103	10k	
R845	ERJ3GEYJ221	220	
R846	ERJ3GEYJ103	10k	
R847	ERJ3GEYJ102	1k	
R848	ERJ3GEYJ102	1k	
R849	ERJ3GEY0R00	0	
R850	ERJ3GEYJ102	1k	
R851	ERJ3GEYJ103	10k	
R852	ERJ3GEYJ103	10k	
R853	ERJ3GEYJ103	10k	
R877	ERJ3GEYJ102	1k	
R878	ERJ3GEYJ102	1k	
R879	ERJ3GEYJ562	5.6k	
R880	ERJ3GEY0R00	0	
R881	ERJ3GEYJ102	1k	
R882	ERJ3GEYJ104	100k	
R885	ERJ3GEY0R00	0	
R886	ERJ3GEY0R00	0	
R887	ERJ3GEY0R00	0	
R888	ERJ3GEY0R00	0	
R889	ERJ3GEY0R00	0	
R890	ERJ3GEY0R00	0	
R891	ERJ3GEY0R00	0	
R892	ERJ3GEY0R00	0	
R893	ERJ3GEY0R00	0	
R894	ERJ3GEY0R00	0	
R895	ERJ3GEY0R00	0	
R899	ERJ3GEYJ103	10k	
R900	ERJ3GEYJ103	10k	
R910	ERJ3GEYJ103	10k	
R911	ERJ3GEYJ103	10k	
R912	ERJ3GEYJ103	10k	
R913	ERJ3GEY0R00	0	
R921	ERJ3GEYJ102	1k	
R922	ERJ3GEYJ103	10k	
R924	ERJ3GEYJ103	10k	
R925	ERJ3GEYJ102	1k	
R926	ERJ3GEYJ474	470k	
R927	ERJ3GEYJ474	470k	
R928	ERJ3GEYJ201	200	
R942	ERJ3GEYJ104	100k	
R953	ERJ3GEYJ561	560	
R957	ERJ3GEYJ103	10k	
R958	ERJ3GEYJ103	10k	
R959	ERJ3GEYJ103	10k	
R960	ERJ3GEYJ104	100k	
R961	ERJ3GEYJ104	100k	
R963	ERJ3GEYJ153	15k	
J501	ERJ3GEY0R00	0	
J600	ERJ3GEY0R00	0	
J701	ERJ3GEY0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
C139	ERJ3GEYJ472	4.7k	
C239	ERJ3GEYJ472	4.7k	
C267	ERJ3GEY0R00	0	
C339	ERJ3GEYJ472	4.7k	
C367	ERJ3GEY0R00	0	
C439	ERJ3GEYJ472	4.7k	
C467	ERJ3GEY0R00	0	
C534	ERJ3GEY0R00	0	
C681	ERJ3GEY0R00	0	
C703	ERJ3GEYJ105	1M	
		(CAPACITORS)	
C101	ECQE2E224JZ	0.22	S
C102	ECKT2H101KB	100P	
C103	ECKT2H101KB	100P	
C104	ECKD2H681KB	680P	S
C105	ECKD2H681KB	680P	S
C108	ECEA1CKA100	10	
C109	PQCUV1E333MD	0.033	S
C110	PQCUV1E333MD	0.033	S
C113	ECUV1H682KBV	0.0068	
C114	ECUV1C104KBV	0.1	
C123	ECUV1H220JCV	22P	
C124	ECUV1H220JCV	22P	
C132	ECEA1CKA100	10	
C134	ECUV1C104KBV	0.1	
C135	ECUV1C104KBV	0.1	
C136	ECEA1CKA100	10	
C138	ECUV1C104KBV	0.1	
C140	ECUV1A105ZFV	1	
C141	ECUV1A105ZFV	1	
C151	ECUV1C104ZFV	0.1	
C152	ECUV1H103KBV	0.01	S
C153	ECUV1H103KBV	0.01	S
C154	ECUV1H103KBV	0.01	S
C155	ECUV1H103KBV	0.01	S
C156	ECUV1C104ZFV	0.1	
C157	ECUV1C104ZFV	0.1	
C158	ECUV1H103KBV	0.01	S
C159	ECUV1H103KBV	0.01	S
C160	ECUV1H103KBV	0.01	S
C161	ECUV1H103KBV	0.01	S
C162	ECUV1H102KBV	0.001	
C163	ECUV1H470JCV	47P	
C165	ECUV1H010CCV	1P	
C166	ECUV1C104ZFV	0.1	
C167	ECUV1H102KBV	0.001	
C168	ECUV1H100DCV	10P	
C169	ECUV1H183KBV	0.018	
C201	ECQE2E224JZ	0.22	S
C202	ECKT2H101KB	100P	
C203	ECKT2H101KB	100P	
C204	ECKD2H681KB	680P	S
C205	ECKD2H681KB	680P	S
C208	ECEA1CKA100	10	

Ref. No.	Part No.	Part Name & Description	Remarks
C209	PQCUV1E333MD	0.033	S
C210	PQCUV1E333MD	0.033	S
C213	ECUV1H682KBV	0.0068	
C214	ECUV1C104KBV	0.1	
C223	ECUV1H220JCV	22P	
C224	ECUV1H220JCV	22P	
C232	ECEA1CKA100	10	
C234	ECUV1C104KBV	0.1	
C235	ECUV1C104KBV	0.1	
C236	ECEA1CKA100	10	
C238	ECUV1C104KBV	0.1	
C240	ECUV1A105ZFV	1	
C241	ECUV1A105ZFV	1	
C251	ECUV1C104ZFV	0.1	
C252	ECUV1H103KBV	0.01	S
C253	ECUV1H103KBV	0.01	S
C254	ECUV1H103KBV	0.01	S
C255	ECUV1H103KBV	0.01	S
C256	ECUV1C104ZFV	0.1	
C257	ECUV1C104ZFV	0.1	
C258	ECUV1H103KBV	0.01	S
C259	ECUV1H103KBV	0.01	S
C260	ECUV1H103KBV	0.01	S
C261	ECUV1H103KBV	0.01	S
C262	ECUV1H102KBV	0.001	
C263	ECUV1H470JCV	47P	
C269	ECUV1H183KBV	0.018	
C301	ECQE2E224JZ	0.22	S
C302	ECKT2H101KB	100P	
C303	ECKT2H101KB	100P	
C304	ECKD2H681KB	680P	S
C305	ECKD2H681KB	680P	S
C308	ECEA1CKA100	10	
C309	PQCUV1E333MD	0.033	S
C310	PQCUV1E333MD	0.033	S
C313	ECUV1H682KBV	0.0068	
C314	ECUV1C104KBV	0.1	
C323	ECUV1H220JCV	22P	
C324	ECUV1H220JCV	22P	
C332	ECEA1CKA100	10	
C334	ECUV1C104KBV	0.1	
C335	ECUV1C104KBV	0.1	
C336	ECEA1CKA100	10	
C338	ECUV1C104KBV	0.1	
C340	ECUV1A105ZFV	1	
C341	ECUV1A105ZFV	1	
C351	ECUV1C104ZFV	0.1	
C352	ECUV1H103KBV	0.01	S
C353	ECUV1H103KBV	0.01	S
C354	ECUV1H103KBV	0.01	S
C355	ECUV1H103KBV	0.01	S
C356	ECUV1C104ZFV	0.1	
C357	ECUV1C104ZFV	0.1	
C358	ECUV1H103KBV	0.01	S

Ref. No.	Part No.	Part Name & Description	Remarks
C359	ECUV1H103KBV	0.01	S
C360	ECUV1H103KBV	0.01	S
C361	ECUV1H103KBV	0.01	S
C362	ECUV1H102KBV	0.001	
C363	ECUV1H470JCV	47P	
C369	ECUV1H183KBV	0.018	
C401	ECQE2E224JZ	0.22	S
C402	ECKT2H101KB	100P	
C403	ECKT2H101KB	100P	
C404	ECKD2H681KB	680P	S
C405	ECKD2H681KB	680P	S
C408	ECEA1CKA100	10	
C409	PQCUV1E333MD	0.033	S
C410	PQCUV1E333MD	0.033	S
C413	ECUV1H682KBV	0.0068	
C414	ECUV1C104KBV	0.1	
C423	ECUV1H220JCV	22P	
C424	ECUV1H220JCV	22P	
C432	ECEA1CKA100	10	
C434	ECUV1C104KBV	0.1	
C435	ECUV1C104KBV	0.1	
C436	ECEA1CKA100	10	
C438	ECUV1C104KBV	0.1	
C440	ECUV1A105ZFV	1	
C441	ECUV1A105ZFV	1	
C451	ECUV1C104ZFV	0.1	
C452	ECUV1H103KBV	0.01	S
C453	ECUV1H103KBV	0.01	S
C454	ECUV1H103KBV	0.01	S
C455	ECUV1H103KBV	0.01	S
C456	ECUV1C104ZFV	0.1	
C457	ECUV1C104ZFV	0.1	
C458	ECUV1H103KBV	0.01	S
C459	ECUV1H103KBV	0.01	S
C460	ECUV1H103KBV	0.01	S
C461	ECUV1H103KBV	0.01	S
C462	ECUV1H102KBV	0.001	
C463	ECUV1H470JCV	47P	
C469	ECUV1H183KBV	0.018	
C502	EEUFC1E331	330	
C503	ECUV1H221JCV	220P	
C504	EEUFC1A471	470	
C507	ECUV1C104ZFV	0.1	
C508	ECEA1AKA101	100	
C510	EEUFC1E331	330	
C512	EEUFC1A471	470	
C514	PQCUV1H103ZF	0.01	
C516	ECEA0JU102	1000	
C518	ECUV1H102KBV	0.001	
C519	ECUV1C104ZFV	0.1	
C520	ECEA1CKA100	10	
C521	ECEA1CKA100	10	
C522	ECEA1CKA100	10	
C523	ECEA1CKA100	10	

Ref. No.	Part No.	Part Name & Description	Remarks
C524	ECEA1CKA100	10	
C525	PQCUV1E104MD	0.1	S
C526	PQCUV1E104MD	0.1	S
C527	ECEA1CKA100	10	
C529	ECEA1CKA100	10	
C531	ECUV1C104ZFV	0.1	
C532	ECEA1AKA101	100	
C533	PQCUV1E104MD	0.1	S
C535	ECUV1C104ZFV	0.1	
C601	ECUV1H472KBV	0.0047	
C602	ECUV1H471JCV	470P	S
C603	ECUV1C104ZFV	0.1	
C604	ECUV1C104ZFV	0.1	
C605	ECEA1AKA101	100	
C606	ECUV1H333KBV	0.033	S
C607	ECUV1C104KBV	0.1	
C608	ECUV1C104KBV	0.1	
C609	ECEA1HKA010	1	
C610	ECEA1CKA100	10	
C611	PQCUV1C474ZF	0.47	
C612	ECUV1C104KBV	0.1	
C613	ECUV1H472KBV	0.0047	
C614	ECEA1CKA100	10	
C615	ECUV1H392KBV	0.0039	
C616	ECUV1H392KBV	0.0039	
C617	ECUV1H472KBV	0.0047	
C618	ECUV1C104ZFV	0.1	
C619	ECUV1H101JCV	100P	
C620	ECUV1C104ZFV	0.1	
C621	ECUV1C104ZFV	0.1	
C622	ECEA0JU102	1000	
C623	ECUV1C104ZFV	0.1	
C624	ECEA1AKA101	100	
C625	ECUV1H103KBV	0.01	S
C626	ECUV1C104ZFV	0.1	
C627	ECUV1H153KBV	0.015	
C629	ECEA1CKS470	47	S
C630	ECEA1CKS470	47	S
C631	ECUV1H332KBV	0.0033	
C633	ECUV1H220JCV	22P	
C637	ECUV1A105ZFV	1	
C638	ECUV1A105ZFV	1	
C643	ECEA1AU221	220	
C644	ECEA1CKA100	10	
C648	ECUV1C104KBV	0.1	
C649	ECUV1C104KBV	0.1	
C650	ECUV1H271KBV	270P	
C657	ECUV1A224KBV	0.22	
C658	ECUV1A224KBV	0.22	
C659	ECUV1C104ZFV	0.1	
C662	ECUV1C104ZFV	0.1	
C663	ECUV1H561JCV	560P	S
C669	ECUV1C104KBV	0.1	
C670	ECUV1H103KBV	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C671	ECUV1C104KBV	0.1	
C672	ECUV1H103KBV	0.01	
C679	ECUV1H332KBV	0.0033	
C680	ECUV1H332KBV	0.0033	
C682	ECUV1H332KBV	0.0033	
C683	ECUV1H332KBV	0.0033	
C684	ECUV1H101JCV	100P	
C685	ECUV1H101JCV	100P	
C686	ECUV1H101JCV	100P	
C687	ECUV1H101JCV	100P	
C688	ECUV1H101JCV	100P	
C689	ECUV1H101JCV	100P	
C690	ECEA1AKA101	100	
C691	PQCUV1A105KB	1	
C692	ECUV1H562KBV	0.0056	
C693	ECUV1H101JCV	100P	
C694	ECUV1H101JCV	100P	
C701	ECUV1H472KBV	0.0047	
C705	ECEA1AKA101	100	
C706	ECUV1C104ZFV	0.1	
C707	ECUV1C104ZFV	0.1	
C708	ECUV1C104ZFV	0.1	
C709	ECUV1C104ZFV	0.1	
C710	ECUV1C104ZFV	0.1	
C711	ECUV1C104ZFV	0.1	
C712	ECUV1C104ZFV	0.1	
C713	ECUV1C104ZFV	0.1	
C714	ECUV1C104ZFV	0.1	
C715	ECUV1C104ZFV	0.1	
C716	ECUV1H103KBV	0.01	
C719	ECUV1C104ZFV	0.1	
C720	ECUV1C104ZFV	0.1	
C724	ECUV1C104ZFV	0.1	
C725	ECUV1C104ZFV	0.1	
C726	ECUV1C104ZFV	0.1	
C727	ECUV1H220JCV	22P	
C728	ECUV1H220JCV	22P	
C729	ECUV1H121JCV	120P	
C730	ECUV1H121JCV	120P	
C732	ECUV1H220JCV	22P	
C801	ECST0JY106	10	
C802	ECUV1H103KBV	0.01	
C803	ECUV1H103KBV	0.01	
C804	ECUV1C104KBV	0.1	
C805	ECST0JY106	10	
C806	ECUV1C473KBV	0.047	
C808	ECUV1C104KBV	0.1	
C810	ECUV1C104KBV	0.1	
C811	ECST0JY106	10	
C812	ECUV1H103KBV	0.01	
C813	ECST0JY106	10	
C814	ECUV1H103KBV	0.01	
C815	ECUV1C104KBV	0.1	
C816	ECUV1H103KBV	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C817	ECUV1H103KBV	0.01	
C818	ECUV1C104KBV	0.1	
C819	ECST0JY106	10	
C820	ECUV1H180JCV	18P	
C821	ECUV1H180JCV	18P	
C822	ECUV1H103KBV	0.01	
C823	ECUV1H103KBV	0.01	
C825	ECUV1H103KBV	0.01	
C853	ECUV1H270JCV	27P	
C854	ECUV1H270JCV	27P	
C855	ECUV1H222KBV	0.0022	
C856	ECUV1H181JCV	180P	
C857	ECUV1H392KBV	0.0039	
C858	ECUV1H103KBV	0.01	S
C859	ECUV1H103KBV	0.01	S
C860	ECA0JM471	470P	
C863	ECUV1H103KBV	0.01	
C864	ECUV1C104KBV	0.1	
C865	ECUV1H100DCV	10P	
C866	ECUV1H100DCV	10P	
C867	ECUV1H100DCV	10P	
C868	ECUV1H100DCV	10P	
C869	ECUV1H100DCV	10P	
C870	ECUV1H100DCV	10P	
C871	ECUV1H100DCV	10P	
C872	ECUV1H100DCV	10P	
C873	ECUV1H100DCV	10P	
C874	ECUV1H100DCV	10P	
C875	ECUV1H100DCV	10P	
C876	ECUV1H100DCV	10P	
C877	ECST0JY106	10	
C878	ECUV1C104KBV	0.1	
C879	ECUV1H103KBV	0.01	
C880	ECUV1H103KBV	0.01	
C881	ECUV1H103KBV	0.01	
C882	ECUV1H103KBV	0.01	
C883	ECUV1H103KBV	0.01	
C884	ECUV1H103KBV	0.01	
C885	ECUV1H103KBV	0.01	
C886	ECUV1H103KBV	0.01	
C887	ECUV1H221JCV	220P	
C888	ECUV1C104KBV	0.1	
C889	ECUV1H470JCV	47P	
C891	ECUV1H103KBV	0.01	
C892	ECUV1H103KBV	0.01	
C894	ECUV1C393KBV	0.039	
C895	ECUV1C104KBV	0.1	
L900	ECUV1H020CCV	2P	
J601	ECUV1C104ZFV	0.1	
R137	ECUV1H183KBV	0.018	
R237	ECUV1H183KBV	0.018	
R337	ECUV1H183KBV	0.018	
R437	ECUV1H183KBV	0.018	
R823	ECUV1H102KBV	0.001	

Ref. No.	Part No.	Part Name & Description	Remarks
R824	ECUV1H102KBV	0.001	
R825	ECUV1H102KBV	0.001	
R826	ECUV1H102KBV	0.001	

16.1.3. OPERATIONAL P. C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQWP2G4000BH	ORERATIONAL P.C.BOARD ASS'Y (RTL)	
		(TRANSISTORS)	
Q901	UN5213	TRANSISTOR(SI)	S
Q902	UN5213	TRANSISTOR(SI)	S
Q903	UN5213	TRANSISTOR(SI)	S
Q904	UN5213	TRANSISTOR(SI)	S
Q905	UN5213	TRANSISTOR(SI)	S
Q906	UN5213	TRANSISTOR(SI)	S
Q907	UN5213	TRANSISTOR(SI)	S
Q908	UN5213	TRANSISTOR(SI)	S
Q909	UN5213	TRANSISTOR(SI)	S
Q910	UN521	TRANSISTOR(SI)	
Q911	UN5213	TRANSISTOR(SI)	S
Q912	2SD1819A	TRANSISTOR(SI)	
Q913	UN5113	TRANSISTOR(SI)	S
		(DIODES)	
D901	MA8030	DIODE(SI)	
		(CONNECTORS)	
CN901	PQJS34X54Z	CONNECTOR	
CN902	PQJS18B27Z	CONNECTOR	
		(LEDS)	
LED901	PQVDSML210L	LED	
LED902	PQVDSML210L	LED	
LED903	PQVDSML210L	LED	
LED904	PQVDSML210L	LED	
LED905	PQVDSML210L	LED	
LED906	PQVDSML210L	LED	
LED907	PQVDSML210L	LED	
LED908	PQVDSML210L	LED	
LED909	PQVDSML210L	LED	
LED910	PQVDSML310MT	LED	S
LED911	PQVDSML310MT	LED	S
LED912	PQVDSML310MT	LED	S
LED913	PQVDSML310MT	LED	S
LED914	PQVDSML310MT	LED	S
LED915	PQVDSML310MT	LED	S
LED916	PQVDSML310MT	LED	S
LED917	PQVDSML310MT	LED	S
LED918	PQVDSML210L	LED	
		(SWITCH)	
HS901	ESE14A211	PUSH SWITCH, HOOK	
		(RESISTORS)	
R901	ERJ3GEYF824	820k	
R902	ERJ3GEYF434	430k	
R906	ERJ3GEYJ181	180	
R907	ERJ3GEYJ181	180	

Ref. No.	Part No.	Part Name & Description	Remarks
R908	ERJ3GEYJ181	180	
R909	ERJ3GEYJ181	180	
R910	ERJ3GEYJ103	10k	
R911	ERJ3GEYJ472	4.7k	
R914	PQ4R10XJ821	820	S
R915	PQ4R10XJ561	560	S
R916	PQ4R10XJ561	560	S
R917	PQ4R10XJ821	820	S
R918	PQ4R10XJ821	820	S
R919	PQ4R10XJ561	560	S
R920	PQ4R10XJ561	560	S
R921	PQ4R10XJ821	820	S
R922	PQ4R10XJ561	560	S
R923	ERJ8GEYJ391	390	
J902	PQ4R18XJ000	0	S
J903	PQ4R18XJ000	0	S
J904	PQ4R10XJ000	0	S
		(CAPACITORS)	
C901	ECUV1C104KBV	0.1	
C902	ECUV1C104KBV	0.1	
C903	ECUV1C104KBV	0.1	
C904	ECUV1C104KBV	0.1	
C905	ECUV1C104KBV	0.1	
C906	PQCUV1C224KB	0.22	
C911	PQCUV1C105ZF	1	
		RF BLOCK	
PCB3	PQWPTG2000KT	RF BLOCK	

16.2. Cordless Handset

16.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
100	PQADGP0741GN	LIQUID CRYSTAL DISPLAY	
101	PQAX2P07Z	SPEAKER	
102	PQJT10160Y	CHARGE TERMINAL	
103	PQSA10099Z	ANTENNA	
104	PQSX10124Z	RUBBER SWITCH	
105	PQKF10314X1	REAR CABINET	S
106	PQKK10100Z1	BATTERY COVER	S
107	PQBC10296Z1	BUTTON, NAVI	S
108	PQBX10329Z1	BUTTON, 2KEY	S
109	PQGP10159Z1	LCD PANEL	S
110	PQGT14159Z	NAME PLATE	
111	PQKE10100Z1	HEADSET JACK COVER	S
112	PQYM10094Z1	CABINET BODY	
113	PQHE10109Z	SPONGE, BATTERY COVER	
114	PQHR10727Z	LCD PLATE	
115	PQHR10728Z	SPEAKER HOLDER	
116	PQHR10729Z	LCD HOLDER	
117	PQHS10293Z	RUBBER SHEET, SPEAKER	
118	PQHX10862Z	LCD COVER SHEET	
119	PQQT22035Z	CHARGE LABEL	
120	PQHP506SVC	RECHARGEABLE BATTERY	S
121	PQHR10771Y	LCD SPONGE	
122	PQHG10585Z	RUBBER SHEET, RINGER	

16.2.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPTG4000BR	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC1	PQVIPMB5724T	IC	
IC3	PQWITG2000RH	IC ASS'Y	S
IC4	PQVI24LC64IT	IC	S
		(TRANSISTORS)	
Q1	2SD601A	TRANSISTOR(SI)	
Q5	2SB1218A	TRANSISTOR(SI)	
Q6	PQVTFDN335N	TRANSISTOR(SI)	
Q7	2SB1218A	TRANSISTOR(SI)	
Q8	UN521	TRANSISTOR(SI)	S
Q10	PQVTDTC143E	TRANSISTOR(SI)	
Q11	PQVTDTC143E	TRANSISTOR(SI)	
Q14	PQVTBC80825T	TRANSISTOR(SI)	S
Q17	PQVTDTC143E	TRANSISTOR(SI)	
Q18	PSVTFDC634P	TRANSISTOR(SI)	
Q19	UN5213	TRANSISTOR(SI)	S
		(DIODES)	
D19	MA2Z72000	DIODE(SI)	
D20	MA735	DIODE(SI)	
D21	MA153	DIODE(SI)	
D22	MA2Z72000	DIODE(SI)	
D23	MA2Z72000	DIODE(SI)	
D24	MA2Z72000	DIODE(SI)	
D25	PQVDRLZ5R6	DIODE(SI)	
D26	MA8150	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D27	MA8150	DIODE(SI)	
D29	MA8150	DIODE(SI)	
		(CHARGE TERMINALS)	
JTM	PQJT10152Z	CHARGE TERMINAL	
JTP	PQJT10152Z	CHARGE TERMINAL	
		(CONNECTORS)	
SK2	PQJP2D13Z	CONNECTOR	
JP4	PQJS18A96Z	CONNECTOR	
ROM_S	PQJS32B35Z	CONNECTOR	
		(CRYSTAL OSCILLATOR)	
X1	PQVCF1036N6Z	CRYSTAL OSCILLATOR	
		(COILS)	
L1	PQLES01C220	COIL	
L2	ELJPA100KF	COIL	
L3	ELJPA100KF	COIL	
L4	PQLQR2M5N6K	COIL	
L88	PQLQR1T1ROM	COIL	
		(JACKS)	
J3	PQJJ1J007Z	JACK, EAR	
		(LEDS)	
D3	PQVDSML310MT	LED	S
D4	PQVDSML310MT	LED	S
D5	PQVDSML310MT	LED	S
D6	PQVDSML310MT	LED	S
D16	PQVDPY1112H	LED	S
D17	PQVDPY1112H	LED	S
D18	PQVDPY1112H	LED	S
		(OTHER)	
LS1	PQEFBDB111GF	BUZZER	
MIC	PQJM146Z	MICROPHONE	
		(RESISTORS)	
R1	ERJ3GEYJ222	2.2k	
R2	ERJ3GEYJ221	220	
R3	ERJ3GEYJ474	470k	
R4	PQ4R18XJ4R7	4.7	S
R5	ERJ3GEYJ103	10k	
R6	ERJ3GEYJ103	10k	
R7	ERJ3GEYJ103	10k	
R8	ERJ3GEYJ103	10k	
R10	ERJ3GEYJ474	470k	
R11	ERJ3GEYJ102	1k	
R12	ERJ3GEYJ473	47k	
R13	ERJ3GEYJ104	100k	
R14	ERJ3GEYJ470	47	
R15	ERJ3GEYJ470	47	
R16	ERJ3GEYJ104	100k	
R18	ERJ3GEYJ104	100k	
R19	ERJ3GEYJ473	47k	
R23	ERJ3GEY0R00	0	
R24	ERJ3GEYJ103	10k	
R26	ERJ3GEYJ103	10k	
R27	ERJ3GEYJ103	10k	
R28	ERJ3GEYJ103	10k	
R29	ERJ3GEYJ103	10k	

Ref. No.	Part No.	Part Name & Description	Remarks
R30	ERJ3GEYJ103	10k	
R31	ERJ3GEYJ103	10k	
R32	ERJ3GEYJ103	10k	
R33	ERJ3GEYJ332	3.3k	
R34	ERJ3GEYJ332	3.3k	
R35	ERJ3GEYJ332	3.3k	
R37	ERJ3GEY0R00	0	
R38	ERJ3GEYJ472	4.7k	
R39	ERJ3GEYJ472	4.7k	
R40	ERJ3GEYJ100	10	
R42	ERJ3GEYJ820	82	
R43	ERJ3GEYJ820	82	
R48	ERJ3GEYJ820	82	
R49	ERJ3GEYJ820	82	
R50	ERJ3GEYJ100	10	
R51	ERJ3GEYJ100	10	
R55	ERJ3GEYJ473	47k	
R56	ERJ3GEY0R00	0	
R57	ERJ3GEYJ100	10	
R59	ERJ3GEYJ100	10	
R60	ERJ3GEYJ683	68k	
R61	ERJ3GEYJ153	15k	
R62	ERJ3EKF2203	220k	S
R63	ERJ3GEYJ100	10	
R64	PQRD32R100	0.1	
R65	ERJ3GEYF104	100k	
R66	ERJ3GEYF183	18k	
R67	ERJ3GEYF104	100k	
R70	ERJ3GEYF824	820k	
R71	ERJ3GEYF434	430k	
R72	ERJ3GEY0R00	0	
R74	ERJ3GEYJ104	100k	
R91	ERJ3GEYJ100	10	
R92	ERJ3GEYJ100	10	
R93	ERJ3GEYJ100	10	
R95	ERJ3GEYJ100	10	
R96	ERJ3GEYJ100	10	
R97	ERJ3GEYJ182	1.8k	
R98	ERJ3GEYJ182	1.8k	
R99	ERJ3GEYJ202	2k	
R100	ERJ3GEYJ100	10	
R101	ERJ3GEYJ100	10	
R102	ERJ3GEYJ100	10	
R104	ERJ3GEYJ473	47k	
R105	ERJ3GEYJ102	1k	
R114	ERJ3GEY0R00	0	
R115	ERJ3GEYJ103	10k	
R116	ERJ3GEYJ103	10k	
R117	ERJ3GEYJ102	1k	
R119	ERJ14YJ271	270	
R120	ERJ14YJ331	330	
R121	ERJ3GEY0R00	0	
R125	ERJ3GEY0R00	0	
R126	ERJ3GEYJ104	100k	

Ref. No.	Part No.	Part Name & Description	Remarks
R127	ERJ3GEYJ100	10	
F2	PQ4R18XJ000	0	
J1	ERJ3GEY0R00	0	
		(CAPACITORS)	
C3	ECST0GY226	22	
C4	ECUV1H101JCV	100P	
C5	ECUV1E223KBV	0.022	
C6	ECUV1H680JCV	68P	
C7	ECUV1H101JCV	100P	
C8	ECUV1E223KBV	0.022	
C10	ECUV1C104KBV	0.1	
C11	ECUV1H332KBV	0.0033	
C12	ECUV1H332KBV	0.0033	
C13	ECUV1H102KBV	0.001	
C14	ECUV1H102KBV	0.001	
C15	ECUV1H103KBV	0.01	
C16	ECUV1C104KBV	0.1	
C17	ECUV1C104KBV	0.1	
C18	ECUV1C104KBV	0.1	
C19	PQCUV1C105ZF	1	
C20	ECUV1C104KBV	0.1	
C22	ECUV1C104KBV	0.1	
C23	ECUV1A105ZFV	1	
C24	ECUV1C104KBV	0.1	
C25	ECEV0JA220	22	
C26	ECST0JTPB337	330	
C27	ECUV1C683KBV	0.068	
C28	ECUV1C683KBV	0.068	
C29	ECUV1C104KBV	0.1	
C30	ECUV1H103KBV	0.01	
C31	ECUV1H103KBV	0.01	
C32	ECUV1H390JCV	39P	
C34	ECUV1C104KBV	0.1	
C35	ECST0JY106	10	
C36	ECUV1C683KBV	0.068	
C37	ECUV1C104KBV	0.1	
C38	ECUV1C104KBV	0.1	
C39	ECUV1C104KBV	0.1	
C40	ECUV1C104KBV	0.1	
C41	ECUV1C104KBV	0.1	
C42	ECUV1H103KBV	0.01	
C43	ECUV1H103KBV	0.01	
C44	ECUV1H103KBV	0.01	
C45	ECUV1C104KBV	0.1	
C46	ECST0JY106	10	
C47	ECUV1C104KBV	0.1	
C48	ECUV1A474ZFV	0.47	
C49	ECUV1A474ZFV	0.47	
C50	ECUV1A474ZFV	0.47	
C51	ECUV1C104KBV	0.1	
C52	ECUV1C104KBV	0.1	
C53	ECUV1C104KBV	0.1	
C54	ECUV1C104KBV	0.1	
C55	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C58	ECUV1A105ZFV	1	
C59	ECUV1H100DCV	10P	
C60	ECUV1H100DCV	10P	
C61	ECUV1H100DCV	10P	
C62	ECUV1H100DCV	10P	
C63	ECUV1H100DCV	10P	
C64	ECUV1H101JCV	100P	
C65	ECUV1H100DCV	10P	
C66	ECUV1H100DCV	10P	
C67	ECUV1H100DCV	10P	
C68	ECUV1A105ZFV	1	
C70	ECUV1C104KBV	0.1	
C73	ECUV1H070DCV	7P	
C74	ECUV1H100DCV	10P	
C75	ECUV1H100DCV	10P	
C76	ECUV1H070DCV	7P	
C77	ECUV1A105ZFV	1	
C82	ECUV1H070DCV	7P	
C83	ECUV1H070DCV	7P	
C84	ECUV1H070DCV	7P	
C85	ECUV1H070DCV	7P	
C86	ECST0JY106	10	
C87	ECUV1C104KBV	0.1	
C89	ECUV1A105ZFV	1	
C90	ECUV1H100DCV	10P	
C91	ECUV1H100DCV	10P	
C92	ECUV1A105ZFV	1	
L5	ECUV1H010CCV	1P	
R68	ECUV1H333KBV	0.033	S
R103	ECUV1A105ZFV	1	
		RF BLOCK	
PCB200	PQLZ10011Z	RF BLOCK	

16.3. Charger

16.3.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
201	PQYF10163Y1	LOWER CABINET	S
202	PQHR10731Z	LED LENS	
203	PQKM10421Z1	UPPER CABINET	S
204	PQGT14183Z	NAME PLATE	

16.3.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB300	PQWPTG2000CH	P.C.BOARD ASDS'Y(RTL)	
		(TRANSISTORS)	
Q1	2SA933	TRANSISTOR(SI)	
Q2	2SD1991A	TRANSISTOR(SI)	
Q3	2SD2136	TRANSISTOR(SI)	
Q4	2SD1991A	TRANSISTOR(SI)	
Q5	2SD2136	TRANSISTOR(SI)	
Q6	2SA933	TRANSISTOR(SI)	
		(DIODES)	
D1	MA165	DIODE(SI)	
D2	PQVDS5688G	DIODE(SI)	
LED1	PQVDSLR56VCM	LED	
		(JACK)	
CN1	PQJJ1B4Y	JACK	
		(CHARGE TERMINALS)	
CN2	PQJT10162Z	CHARGE TERMINAL	
CN3	PQJT10162Z	CHARGE TERMINAL	
		(RESISTORS)	
R1	ERDS2TJ1R5	1.5	S
R2	ERDS2TJ101	100	
R3	ERDS2TJ102	1k	
R4	ERDS2TJ103	10k	
R5	ERDS2TJ223	22k	
R6	ERDS2TJ222	2.2k	
R7	ERDS2TJ101	100	
R8	ERDS2TJ5R6	5.6	
R9	ERDS2TJ222	2.2k	
R10	ERDS2TJ101	100	
R11	ERDS2TJ5R6	5.6	

16.3.3. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	KX-TCA1-G	AC ADAPTOR	⚠
A2	PQJA10088Z	TEL CORD (4WIRE)	
A3	PQJA212N	CURLCORD	
A4	PQJXF0113Z	HANDSET	
A5	PQLV12Z	AC ADAPTOR	⚠
A6	PQP50AA21	BATTERY	S
A7	PQKE10101Z1	BELT CLIP	S
A8	PQQW12194Z	QUICK REFERENCE GUIDE (ENGLISH)	
A9	PQQW12195Z	QUICK REFERENCE GUIDE (SPANISH)	
A10	PQQX12629Z	INSTRUCTION BOOK	
P1	PQPH10064Z	PROTECTION COVER (BASE UNIT)	
P2	PQPH10067Z	PROTECTION COVER (HANDSET)	
P3	PQPD10463Z	CUSHION	
P4	PQPD10464X	CUSHION	
P5	PQPN11670Z	ACCESSORY BOX	
P6	PQPK13012Z	GIFT BOX	

K(Q) / KXTG4000B / Printed in Japan

(1) (2) (3-13)(14) (15) (16-19) (20-23)(24)(25) (26-29)(30)(31~34)(35~38)(39~42) (43, 44) (45) (46) (47~49)(51~53) (50) (54) (55, 56) (57) (58, 59) (60) (61, 62) (63~67)

Line Receiving Signal (Line 1)

Line Sending Signal (Line 1)

Line Receiving Signal (Line 2)

Line Sending Signal (Line 2)

Line Receiving Signal (Line 3)

Line Sending Signal (Line 3)

Line Receiving Signal (Line 4)

Line Sending Signal (Line 4)

Handset RX

Handset TX

Speakerphone TX

Speakerphone RX

3.5Vp-p

5.0Vp-p

3.5Vp-p

3.5Vp-p

5.0Vp-p

3.5Vp-p

3.5Vp-p

3.5Vp-p

3.5Vp-p

400mVp-p

200mVp-p

1Vp-p

Vol : MAX
2.6Vp-p

200mVp-p

500mVp-p

500mVp-p

300mVp-p

50mVp-p

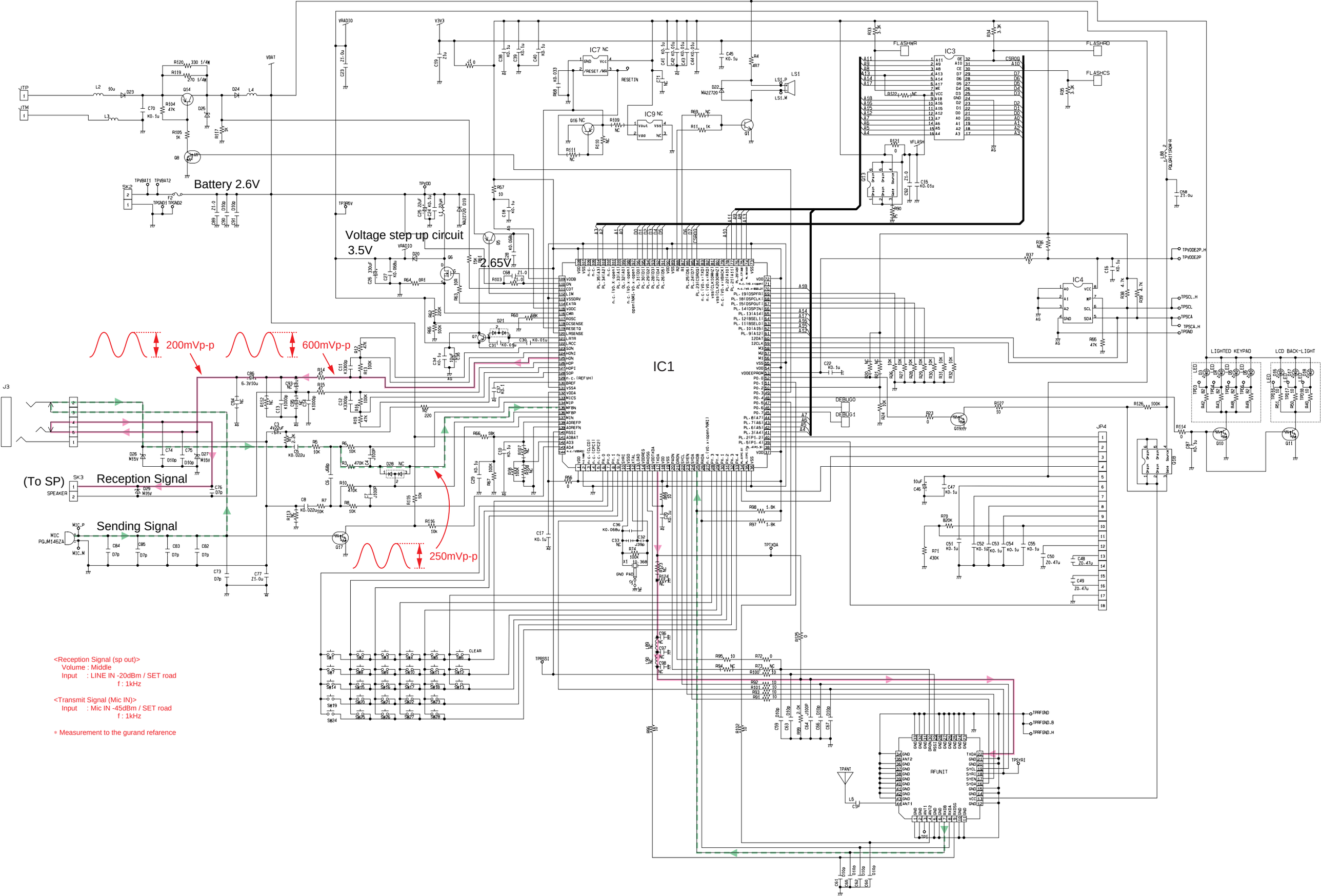
600mVp-p

1.5Vp-p

Line in
<LINE input : -20dBm / SET road>
f : 1KHz

<LINE output : Mic In -45dBm / SET road>
f : 1KHz

Handset Mode : Vol MAX
Sp-Phone Mode : Vol MAX


Battery 2.6V
Voltage step up circuit
3.5V
2.65V
IC1
200mVp-p
600mVp-p
250mVp-p
(To SP)
Reception Signal
Sending Signal
LIGHTED KEYPAD
LCD BACK-LIGHT
RFUNIT
FLASHWR
FLASHRD
FLASHCS
DEBUG0
DEBUG1
CLEAR
<Reception Signal (sp out)>
Volume : Middle
Input : LINE IN -20dBm / SET road
f : 1kHz
<Transmit Signal (Mic IN)>
Input : Mic IN -45dBm / SET road
f : 1kHz
* Measurement to the gurand refarence

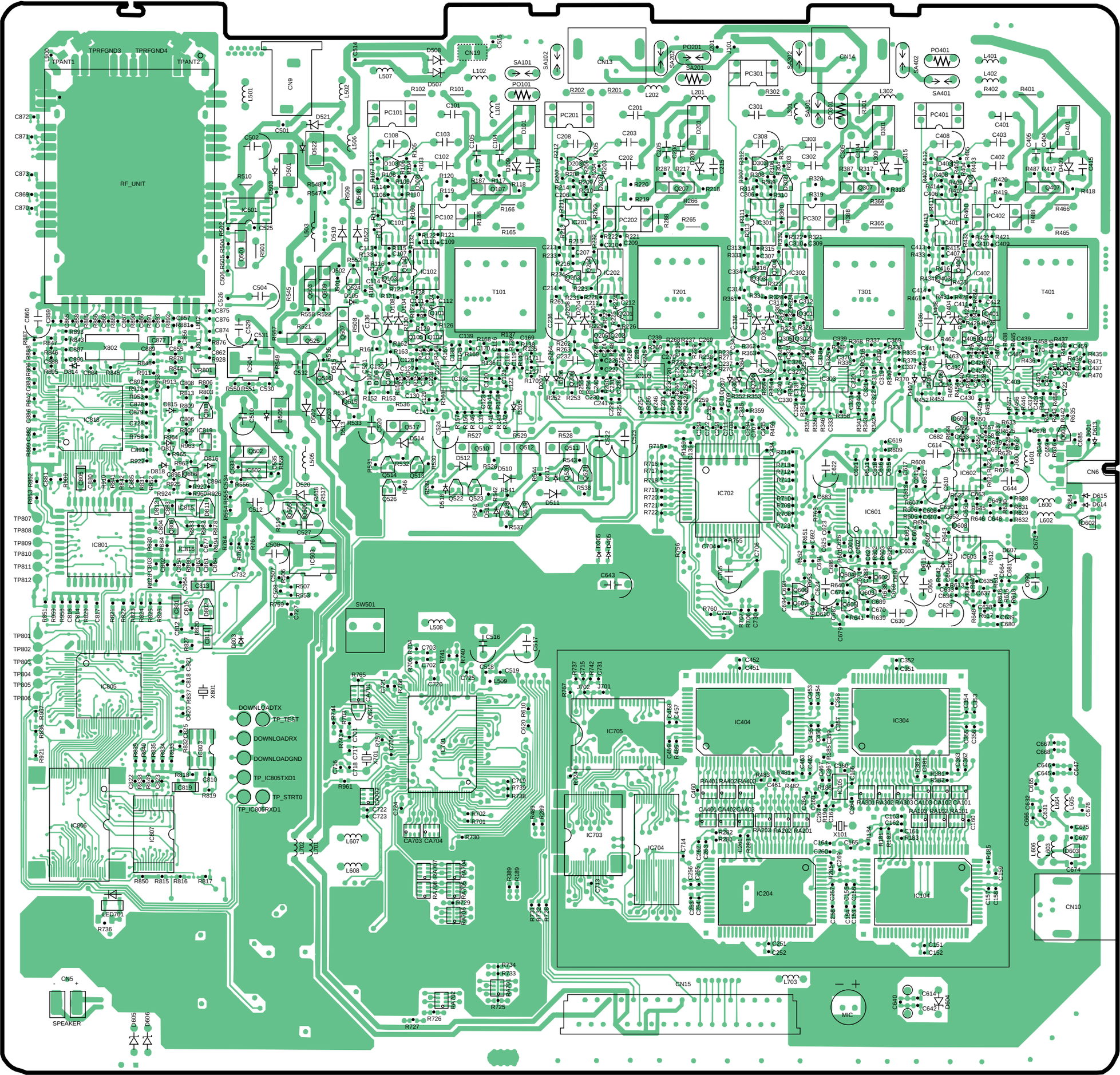
Line 4
Line 3
Line 2
Line 1
TEL Line
TEL Line
TEL Line
TEL Line
DC Voltmeter
DC Power Supply
DC Power Supply
6.9V, 6.3V, 5.7V
12V
130Ω
A
BATT_CN
TPRFGND6
TPRFGND5
L1_R
L1_T
L2_T
L2_R
L3_T
L3_R
L4_R
L4_T
CHG_M
CHG_P
DC_M
DC_P
7R0VREG
TXDA
SYRI
VANA34
5VANA1
VANAREF
VANA12
5R6VREG
5VDIG
3R3VREG
3R7VREG
RSSI
BACKUPDET
TPCE
TPSELECT
TP105
TP104
TP107
TPR8
TPFLASHVDD
TP106
TPRE
TPFLASHGND
TPCLE
TP100
TPWE
TP103
TPWP
TP102
TP101
TPALE
TP_TESTH
TP_STRTOH
DOWNLOADTXH
DOWNLOADRXH
DOWNLOADGNDH
TP_IC805TXD1H
TP_IC805RXD1H
TPSPP
TPSPM
SP_PHONE
ENTER
SEARCHUP
FUNCTION
BACK
FF
EXIT
CLEAR
SEARCHDOWN
HS_RXM
HS_RXP
HS_TXM
HS_TXP
MIC_M
MIC_P
10μF
10μF
10μF
10μF
8Ω
To operation P.C.B.

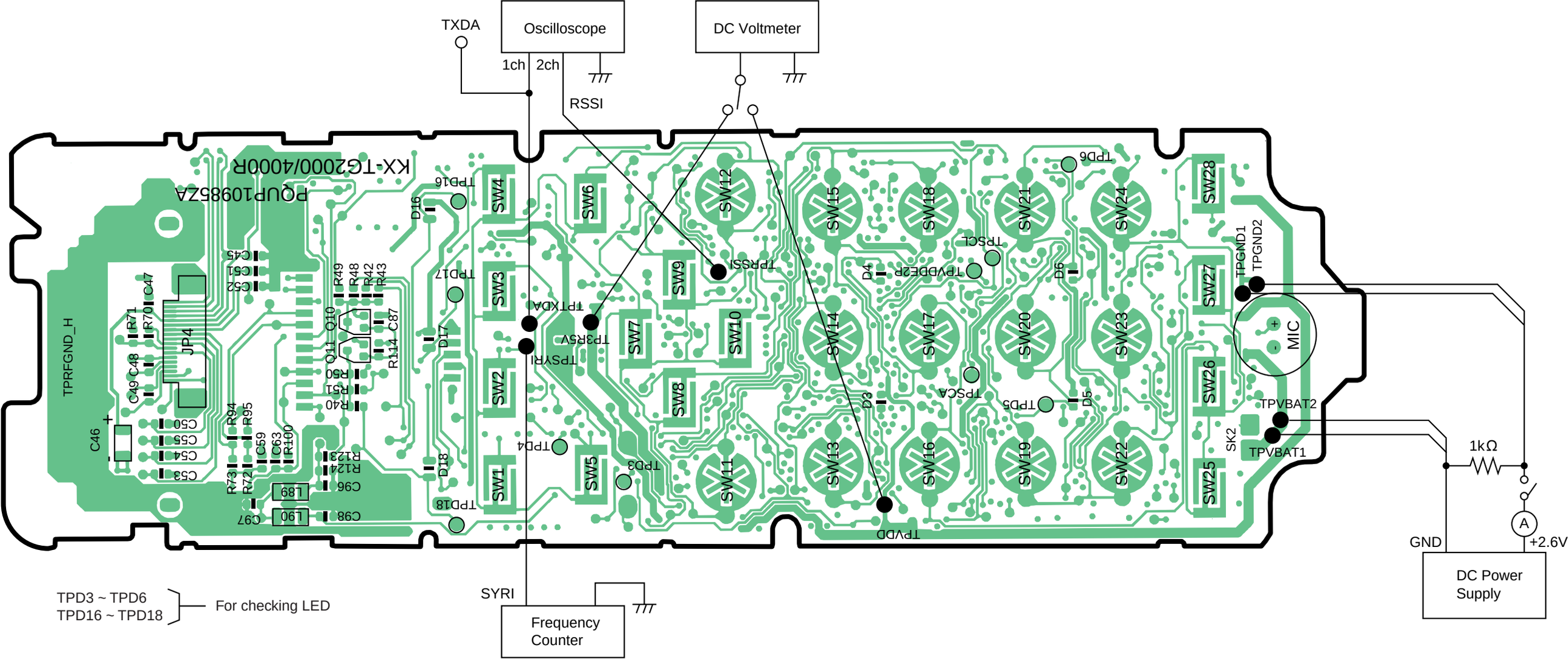
TEL_Line
DTMF SIMULATOR
Oscilloscope
AF OSC (4)
AF OSC (1)
AF OSC (2)
BELL SIMULATOR
CALLER_ID SIMULATOR
AF Volt_meter
LOOP SIMULATOR
600Ω

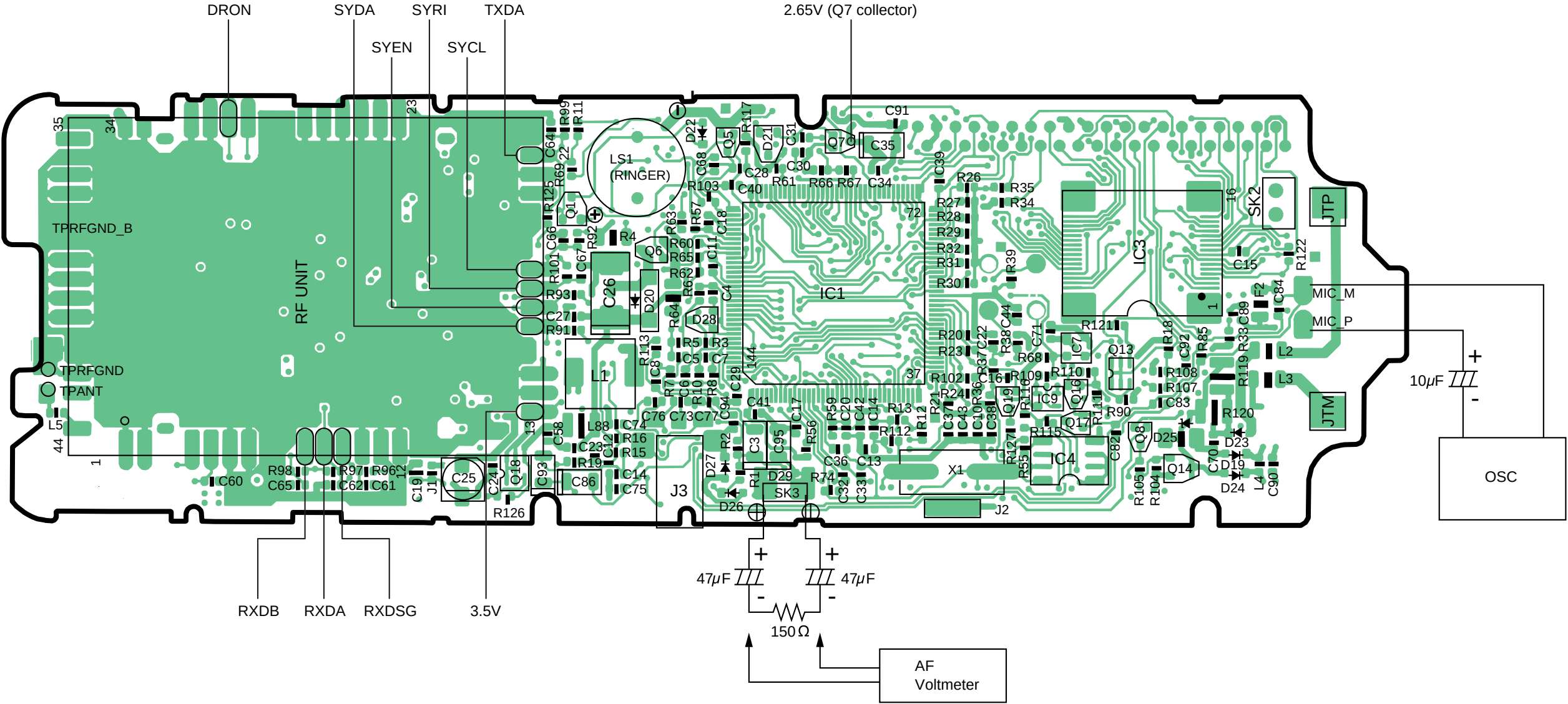
TXDA
1ch
2ch
Oscilloscope
1ch Modulation
2ch RSSI
Frequency Counter
10.368MHz clock frequency
RSSI
Digital Multimeter

Handset SP output
AF Voltmeter
150Ω
AF OSC
Handset mic input

AF OSC
Mic input
AF Voltmeter
SP output


TPRFGND3
TPRFGND4
TPANT1
TPANT2
RF_UNIT
CN9
CN19
SA101
SA102
PO101
CN13
SA201
SA202
PO201
PC301
SA302
GN14
SA402
PO401
SA401
L401
L402
R402
R401
PC101
PC201
PC401
PC102
PC202
PC302
PC402
T101
T201
T301
T401
IC101
IC201
IC301
IC401
IC102
IC202
IC302
IC402
IC501
IC502
IC503
IC504
IC103
IC203
IC303
IC403
IC816
IC819
IC801
IC815
IC805
IC806
IC807
IC702
IC601
IC602
IC603
IC705
IC404
IC304
IC703
IC704
IC204
IC104
X802
X801
X701
X101
VR801
SW501
CN6
CN10
CN5
SPEAKER
MIC
GN15
L703
LED701
DOWNLOADTX
TP_TEST
DOWNLOADRX
DOWNLOADGND
TP_IC805TXD1
TP_STRT0
TP_IC805RXD1


TXDA
Oscilloscope
1ch
2ch
RSSI
DC Voltmeter
KX-TG2000/4000R
PQUP10985ZA
TPRFGND_H
JP4
C46
C49
C48
C50
C55
C54
C53
R71
R70
C47
C45
C51
C52
R94
R95
C59
C63
R100
R73
R72
C97
L89
L90
C96
C98
R123
R124
R49
R48
R42
R43
Q10
Q11
R50
R51
R40
R114
C87
D16
D17
D18
TPD16
TPD17
TPD18
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
SW19
SW20
SW21
SW22
SW23
SW24
SW25
SW26
SW27
SW28
TPTXDA
TPSYRI
TP3R5V
TPD4
TPD3
TPRSSI
TPVDD
TPSCA
TPD5
D3
D4
D5
D6
TPD6
TPSCL
TPVDDE2P
TPGND1
TPGND2
MIC
SK2
TPVBAT2
TPVBAT1
1kΩ
A
GND
+2.6V
DC Power Supply
SYRI
Frequency Counter
TPD3 ~ TPD6
TPD16 ~ TPD18
For checking LED

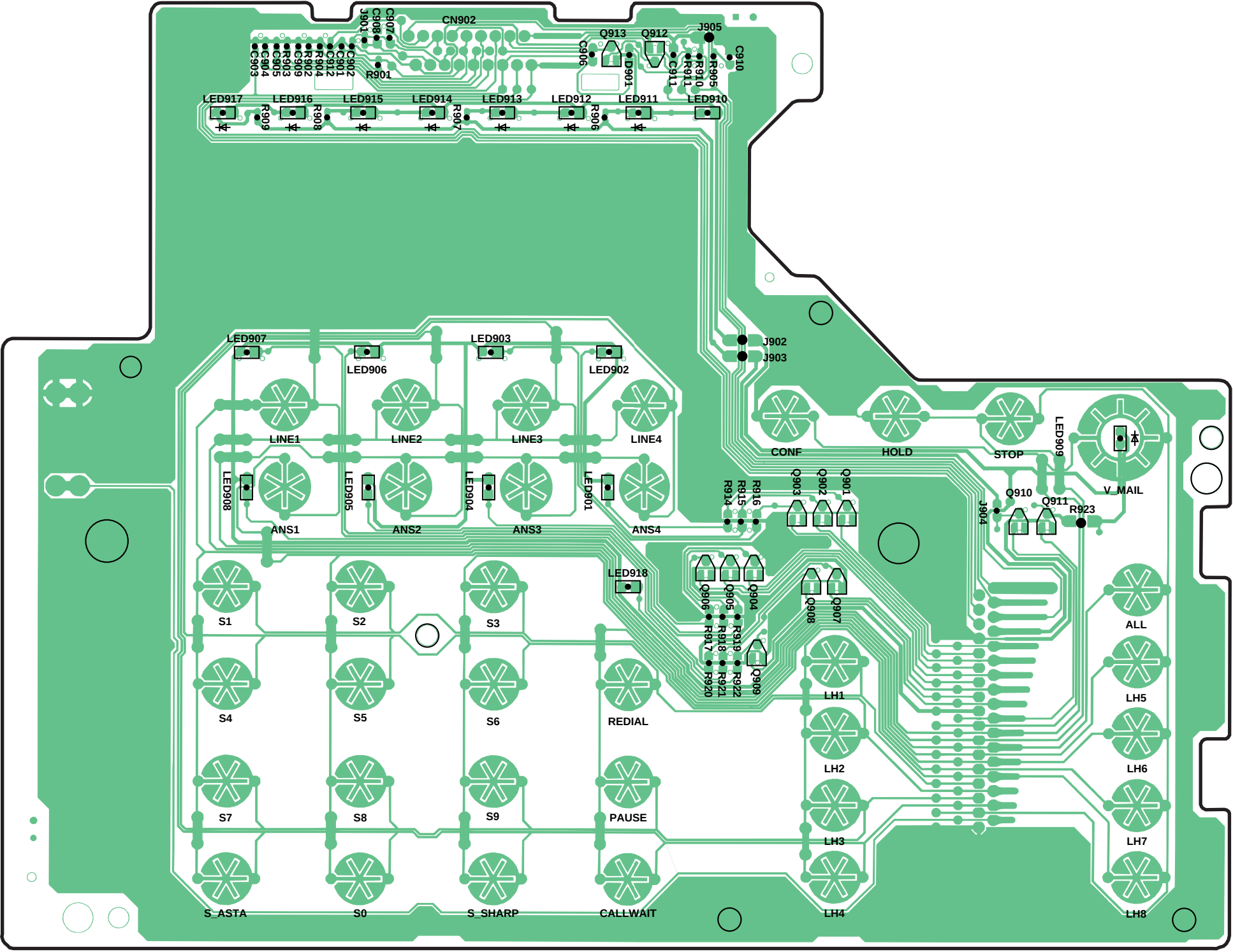

DRON
SYDA
SYEN
SYRI
SYCL
TXDA
2.65V (Q7 collector)
TPRFGND_B
TPRFGND
TPANT
RF UNIT
LS1
(RINGER)
IC1
IC3
IC4
IC7
IC9
L1
L2
L3
L4
L5
X1
J1
J2
J3
SK2
SK3
JTP
JTM
MIC_M
MIC_P
10μF
OSC
47μF
47μF
150Ω
AF
Voltmeter
RXDB
RXDA
RXDSG
3.5V

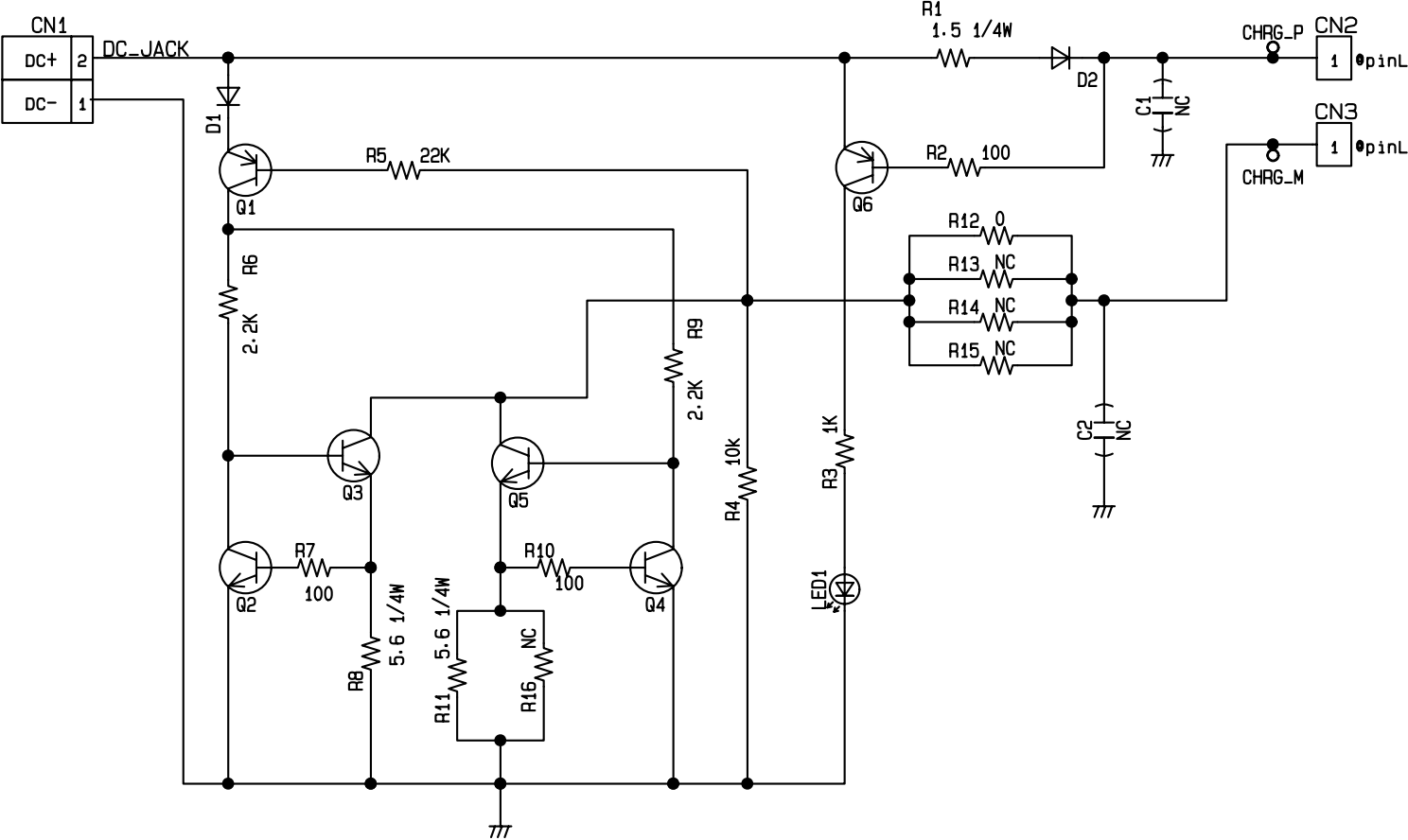
BASE UNIT

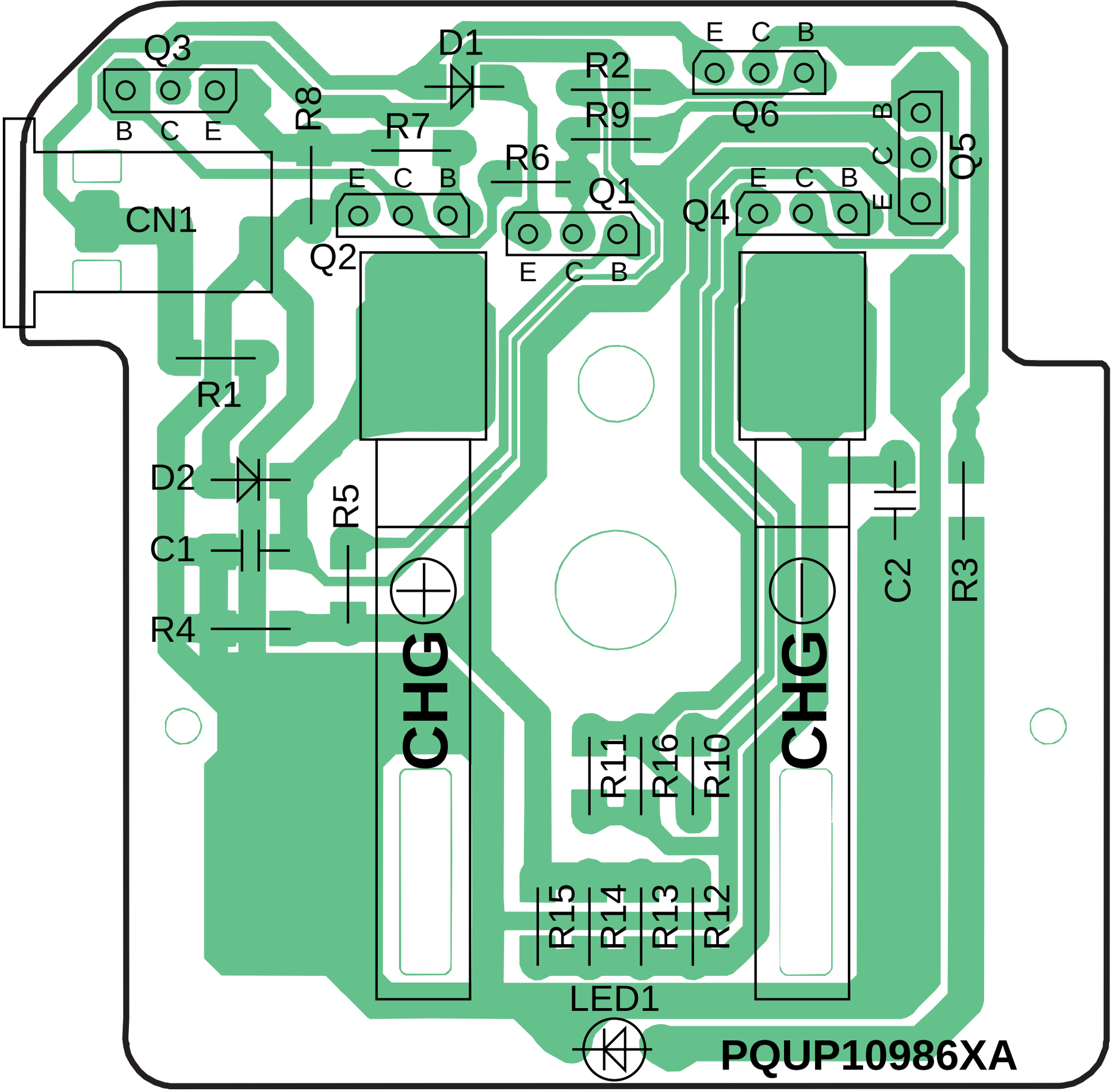
IC104			IC105			IC601			IC701			IC702			IC703			IC704			IC705			IC801			IC805			IC806			IC807			IC818		
Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH	Pin No.	LOW	HIGH
1	0.1	3.1	1		3.1	1	1.6	4.9	1	-	3.2	101	0.1	-	1	0.1	-	1	0.1	3.1	1	0.1	3.2	1	0.1	-	1	0.1	3.3	1	0.1	-	1	0.1	3.3	1	0.1	3.3	1	-	3.3
2	0.1	3.1	2	0.8	2.2	2	-	4.9	2	0.1	3.2	102	0.1	-	2	-	3.2	2	0.1	3.1	2	0.1	3.2	2	0.1	3.1	2	0.1	3.3	2	0.1	-	2	0.1	3.3	2	0.1	3.3	2	0.1	-
3	0.1	3.1	3	0		3	0.1	-	3	0.1	-	103	-	3.2	3	0.1	-	3	0.1	3.1	3	0.1	3.2	3	0.1	-	3	0.1	3.3	3	0.1	3.2	3	0.1	3.3	3	0.1	3.3	3	-	3.3
4	0.1	3.1	4	0		4	0.1	-	4	0.1	-	104	-	3.2	4	0.1	-	4	0.1	3.1	4	0.1	3.2	4	-	3.1	4	0.1	3.3	4	-	3.2	4	0.1	3.3	4	0.1	3.3	4	0.1	3.3
5	0.4	3.1	5	0		5	0.1	-	5	-	3.2	105	-	3.0	5	0.1	-	5	0.1	3.1	5	-	3.2	5	0.1	-	5	0.2	2.8	5	-	3.2	5	0.1	3.3	5	0.1	3.3	5	0.1	3.3
6	-	3.1				6	-	4.9	6	0.1	3.2	106	-	3.0	6	0.1	-	6	0.1	3.1	6	-	3.2	6	0.1	-	6	0.1	-	6	-	3.2	6	0.1	3.3	6	0.1	3.3	6	0.1	3.3
7	0.1	3.1				7	0.1	-	7	0.1	3.2	107	-	3.0	7	0.1	-	7	0.1	3.1	7	0.1	-	7	0.1	-	7	0.1	3.3	7	0.1	-	7	0.1	3.3	7	-	3.3	7	0.1	3.3
8	0.3	3.1				8	-	2.6	8	0.1	3.2	108	-	3.0	8	0.1	-	8	-	3.1	8	-	3.2	8	0.1	-	8	0.1	3.3	8	0.1	-	8	0.1	3.3	8	0.1	3.3	8	0.1	3.3
9	0.2	3.1				9	-	2.4	9	0.1	3.2	109	-	3.0	9	0.1	-	9	0.1	-	9	0.1	-	9	0.1	3.3	9	-	3.3	9	0.1	3.3	9	0.1	3.3	9	0.1	3.3	9	0.1	3.3
10	0.2	2.8				10	-	4.9	10	0.1	-	110	-	3.0	10	0.1	-	10	0.1	3.1	10	0.1	3.2	10	0.1	-	10	0.1	-	10	0.1	3.3	10	0.1	-	10	0.1	3.3	10	0.1	3.3
11	0.1	3				11	0.1	-	11	0.1	3.2	111	-	3.2	11	0.1	-	11	0.1	3.1	11	0.1	3.2	11	0.1	-	11	0.1	3.3	11	-	3.3	11	-	3.3	11	0.1	3.3	11	0.1	3.3
12	0.1	2.9				12	0.6	-	12	0.1	3.2	112	-	3.2	12	0.1	-	12	0.1	3.1	12	0.1	3.2	12	0.1	-	12	0.1	3.3	12	0.1	3.3	12	-	3.3	12	0.1	3.3	12	0.1	3.3
13	0.1	2.8				13	-	2.4	13	0.1	3.2	113	0.1	-	13	-	3.2	13	0.1	3.1	13	0.1	3.2	13	0.1	-	13	0.1	3.3	13	-	3.3	13	0.1	-	13	0.1	3.3	13	0.1	3.3
14	0.1	2.8				14	-	2.4	14	0.1	3.2	114	0.1	-	14	0.1	-	14	0.1	3.1	14	0.1	3.2	14	0.1	-	14	0.1	3.2	14	0.1	3.3	14	0.1	-	14	0.1	3.3	14	-	3.3
15	0.1	-				15	-	2.4	15	0.1	3.2	115	0.1	-	15	0.1	-	15	0.1	3.1	15	0.1	3.2	15	0.1	-	15	-(*1)	3.2	15	0.1	3.3	15	0.1	-	15	0.1	3.3	15	0.1	-
16	0.3	2.5				16	-	2.4	16	0.1	3.2	116	0.1	3.2	16	-	4.9	16	0.1	3.1	16	0.1	3.2	16	0.1	-	16	-(*1)	3.2	16	0.1	3.3	16	0.1	-	16	0.1	3.3	16	0.1	3.3
17	1.6	-				17	-	2.4	17	0.1	3.2	117	0.1	3.2	17	0.1	3.1	17	0.1	3.1	17	0.1	3.2	17	0.1	-	17	0.1	3.3	17	0.1	3.3	17	0.1	3.3	17	0.1	3.3	17	0.1	3.3
18	1.5	-				18	-	2.3	18	0.1	3.2	118	0.1	3.2	18	0.1	3.1	18	0.1	3.1	18	0.1	3.2	18	0.1	3.2	18	0.1	3.3	18	0.1	-	18	0.1	3.3	18	0.1	3.3	18	0.1	3.3
19	-	3.3				19	0.1	-	19	0.1		119	0.1	-	19	0.1	3.1	19	0.1	3.1	19	0.1	3.2	19	0.1	3.2	19	0.1	3.3	19	0.1	3.3	19	0.1	3.3	19	0.1	3.3	19	0.1	3.3
20	0.4	3				20	-	2	20	0.1	3.2	120	0.1	-	20	0.1	3.1	20	0.1	3.1	20	0.1	3.2	20	0.1	3.2	20	0.1	3.3	20	0.1	3.3	20	0.1	3.3	20	0.1	3.3	20	0.1	-(*2)
21	0.1	-(*3)				21	-	2.4	21	0.1	3.2	121	0.1	-	21	0.1	-	21	0.1	3.1	21	0.1	3.2	21	0.1	3.2	21	-	3.3	21	0.1	3.3	21	0.1	3.3	21	0.1	3.3	21	0.1	-
22	0.1	3.1				22	-	2.4	22	0.1	3.2	122	0.1	-	22	0.4	2.9	22	-	3.1	22	0.1	3.2	22	0.1	-	22	-(*1)	3.3	22	0.1	3.3	22	0.1	3.3	22	0.1	3.3	22	0.1	3.3
23	0.1	3				23	-	2.2	23	0.1	3.2	123	-	3.2	23	-	4.4	23	-	3.1	23	0.1	3.2	23	-	3.1	23	0.1	-	23	0.1	3.3	23	0.1	3.3	23	0.1	3.3	23	0.1	-
24	0.1	3.1				24	-	2.4	24	0.1	3.2	124	0.1	-	24	-	4.9	24	0.1	-	24	0.1	-	24	0.1	3.2	24	0.1	3.3	24	0.1	3.3	24	0.1	3.3	24	0.1	3.3	24	0.1	3.3
25	0.1	3.3				25	-	2.4	25	0.1	3.2	125	-	3.2	25	0.1	-	25	0.1	3.1	25	0.1	3.2	25	0.1	3.2	25	0.1	3.3	25	0.1	3.3	25	0.1	3.3	25	0.1	3.3	25	0.1	-
26	0.1	-				26	-	2.4	26	0.1	3.2	126	0.1	-	26	0.1	3.2	26	0.1	3.1	26	0.1	3.2	26	0.1	3.2	26	0.1	3.3	26	0.1	3.3	26	0.1	3.3	26	0.1	3.3	26	-	3.3
27	0.1	3.3				27	0.1	-	27	0.1	3.2	127	0.1	3.2	27	0.1	-	27	0.1	3.1	27	0.1	3.2	27	0.1	3.2	27	0.1	3.3	27	0.1	3.3	27	0.1	-	27	0.1	3.3	27	0.1	3.3
28	0.1	3.3				28	-	4.9	28	0.1	-	128	0.1	3.2	28	0.1	-	28	0.1	3.1	28	0.1	3.2	28	0.1	-	28	0.1	-(*1)	28	0.1	3.3	28	0.1	3.3	28	0.1	3.3	28	0.1	3.3
29	0.1	-				29	0.1	-	29	0.1	3.2				29	0.1	-	29	0.1	3.1	29	0.1	3.2	29	0.1	-	29	-(*1)	3.3	29	0.1	3.3	29	0.1	3.3				29	0.1	3.3
30	0.1	-				30	0.1	-	30	0.1	3.1				30	0.1	3.2	30	0.1	3.1	30	-	3.2	30	0.1	-	30	0.3	-(*1)	30	0.1	3.3	30	0.1	3.3				30	0.1	3.3
31	0.1	-				31	0.1	-	31	0.1	3.1				31	0.1	-	31	0.1	3.1	31	0.1	3.2	31	0.1	-	31	0.1	-	31	0.1	-	31	0.1	3.3				31	0.1	3.3
32	-	3.3				32	-	4.9	32	0.1	3.1				32	0.4	2.9	32	0.1	3.1	32	0.1	3.2	32	0.1	-	32	-	3.3	32	0.1	-	32	0.1	3.3				32	0.1	-
33	-	3.1				33	0.1	3.2	33	0.1	3.2				33	-	4.9				33	0.1	-	33	0.1	3.3	33	0.1	3.3	33	0.1	3.3							33	-	3.3
34	0.1	-				34	0.1	-	34	0.1	3.1				34	0.1	-				34	0.1	-	34	0.1	3.3	34	0.1	3.3	34	0.1	3.3							34	-	4.9
35	0.1	-				35	0.1	3.2	35	0.1	-				35	0.1	-				35	0.1	-	35	0.1	3.3	35	0.1	3.3	35	0.1	3.3							35	0.1	-
36	-	3.1				36	0.1	4.9	36	0.1	-				36	-	3.2				36	0.1	-	36	0.1	-(*1)	36	0.1	3.3	36	0.1	3.3							36	0.1	3.3
37	-	3.1				37	0.1	3.3	37	0.1	3.1				37	0.1	-				37	0.1	-	37	0.1	3.3	37	0.1	3.3	37	-	3.3							37	0.1	3.3
38	-	3.1				38	0.1	-	38	0.1	-				38	0.1	-				38	0.1	-	38	0.1	3.3	38	0.1	3.3	38	0.1	3.3							38	0.1	3.3
39	0.1	3.1				39	0.1	-	39	-	3.2				39	0.1	-				39	0.1	-	39	0.1	3.3	39	0.1	3.3	39	0.1	3.3							39	0.1	-
40	0.1	3.1				40	0.1	3.2	40	0.1	3.2				40	0.1	-				40	0.1	-	40	-	3.3	40	-	3.3	40	0.1	3.3							40	0.1	3.3
41	0.1	3.1				41	0.2	3	41	0.1	3.2				41	0.1	-				41	0.1	-	41	-	3.3	41	0.1	3.3	41	0.1	3.3							41	0.1	3.3
42	0.1	3.1				42	-	4.9	42	0.1	-				42	0.1	-				42	0.1	3.2	42	0.1	-	42	0.1	3.3	42	0.1	3.3							42	0.1	-
43	0.1	3.1				43	0.1	-	43	-	3.2				43	0.1	-				43	-	3.0	43	0.1	3.3	43	0.1	3.3	43	0.1	3.3							43	-	3.3
44	0.1	3.1				44	0.1	-	44	0.1	-				44	0.1	-				44	-	3.2	44	0.1	3.3	44	0.1	3.3	44	0.1	3.3							44	0.1	4.9
45	0.1	3.1							45	0.1	3.3				45	0.1	-										45	0.1	3.3	45	0.1	3.3							45	0.1	3.3
46	0.1	3.1							46	0.1	3.2				46	0.1	-										46	0.1	3.3	46	0.1	-							46	0.1	3.3
47	0.1	3.1							47	0.1	3.2				47	-	3.2										47	0.1	3.3	47	-	3.3							47	0.1	3.3
48	0.1	3.1							48	0.1	3.2				48	0.1	-										48	0.1	3.3	48	0.1	3.3							48	0.1	3.3
49	0.1	3.1							49	0.1	3.1				49	0.1	-										49	0.1	3.3										49	0.1	3.3
50	0.1	3.1							50	0.1	3.1				50	0.1	-										50	0.1	3.3										50	0.1	3.3
51	0.1	3.1							51	0.1	3.1				51	0.1	-										51	0.1	3.3										51	0.1	-
52	-	3.2							52	0.1	3.1				52	-	4.9										52	0.1	3.3										52	-	3.3
53	-	3.3							53	0.1	-				53	0.1	-										53	0.1	3.3										53	0.1	3
54	0.1	-							54	0.1	3.1				54	0.1	-										54	0.1	3.3										54	-	-
55	0.1	-							55	0.1	3.1				55	0.1	-										55	0.1	3.3										55	-	-
56	0.1	-							56	0.1	3.1				56	1.8	-										56	-	3.3										56	0.1	-
57	0.1	3.1							57	0.1	3.1				57	-	4.9										57	0.1	-										57	0.1	-
58	0.1	3.1							58	-	3.2				58	0.1	-										58	0.1	-										58	-	3.3
59	0.1	3.1							59	0.1	3.1				59	0.1	-										59	-	3.2										59	0.1	-
60	0.1	3.1							60	0.1	-				60	0.1	-										60	0.1	3.3										60	0.1	-
61	0.1	3.1							61	0.1	-				61	-	4.9										61	-	3.3										61	0.1	-
62	0.1	3.1							62	0.1	-				62	0.1	-										62	0.1	3.3										62	-	3.3
63	0.1	3.1							63	0.1	3.1				63	0.1	-										63	-	3.3										63	0.1	-
64	0.1	3.1							64	0.1	3.1				64	0.1	-										64	-	3.3										64	0.1	3.3
65	0.1	3.1							65	0.1	-																65	-	3.3										65	0.1	-(*2)
66	0.1	3.1							66	0.1	3.2																66	- -											66	-	2.9
67	0.1	3.1							67	0.1	-																67	-	-										67	0.1	-(*2)
68	0.1	3.1							68	0.1	-																68	0.1	-										68	0.1	-(*2)
69	0.1	3.1							69	0.6	3.18																69	0.1	3										69	0.1	-
70	0.1	3.1							70	0.6	3.18																70	0.1	3.3										70	0.1	-
71	0.1	3.1							71	0.6	3.18																71	0.1	3.3										71	0.1	-
72	0.1	3.1							72	0.6	3.18																72	0.1	3.3										72	-	3.3
73	-	3.3							73	0.1	3.2																73	-	3.3										73	0.1	-(*2)
74	0.1	-							74	0.1	3.2																74	-	3.3										74	0.1	-(*2)
75	0.1	3.1							75	0.1	3.2																75	0.1	3.3										75	0.8	-(*2)
76	0.1	3.1							76	0.1	-																76	0.1	3.3										76	0.1	-(*2)
77	0.1	3.1							77	0.1	-																77	-	3.3										77	0.1	-
78	0.1	3.1							78	0.1	-																78	-	2.5										78	-(*2)	2.6
79	0.1	3.1							79	0.1	-																79	0.1	3.7										79	0.1	-
80	0.1	3.1							80	-	3.2																80	0.1	-										80	0.1	-
									81	0.1	3.2																81	0.1	-										81	-	3.3
									82	-	3.2																82	0.1	-										82	0.1	-
									83	-	3.2																83	0.1	-										83	0.1	3.3
									84	-	3.2																84	1.8	-										84	0.1	3.3
									85	-	2.2																85	0.1	-										85	0.1	3.3
									86	-	-																86	0.9	-										86	0.1	-
									87	0.1	-																87	0.1	-										87	0.1	-
									88	-	3																88	0.1	-										88	0.1	3.3
									89	-	3.2																89	0.1	-										89	0.4	2.3
									90	0.1	3.2																90	-	3.3										90	-	4.9
									91	0.1	3.2																91	-	3.3										91	-	3.3
									92	-.	3.2																92	0.1	-										92	0.1	-
									93	-	3.2																93	0.1	3.3										93	0.1	3.3
									94	-	3.2																94	0.1	-										94	0.1	3.3
									95	0.1	-																95	-	3.3										95	0.1	3.3
									96	0.1	-																96	-	3.3										96	0.1	3.3
									97	0.1	-																97	0.1	3.3										97	0.1	3.3
									98	0.1	-																98	-	3.3										98	0.1	3.3
									99	0.1	-																99	-	3.3										99	0.1	3.3
									100	0.1	-																100	-	3.3										100	0.1	3.3

HANDSET

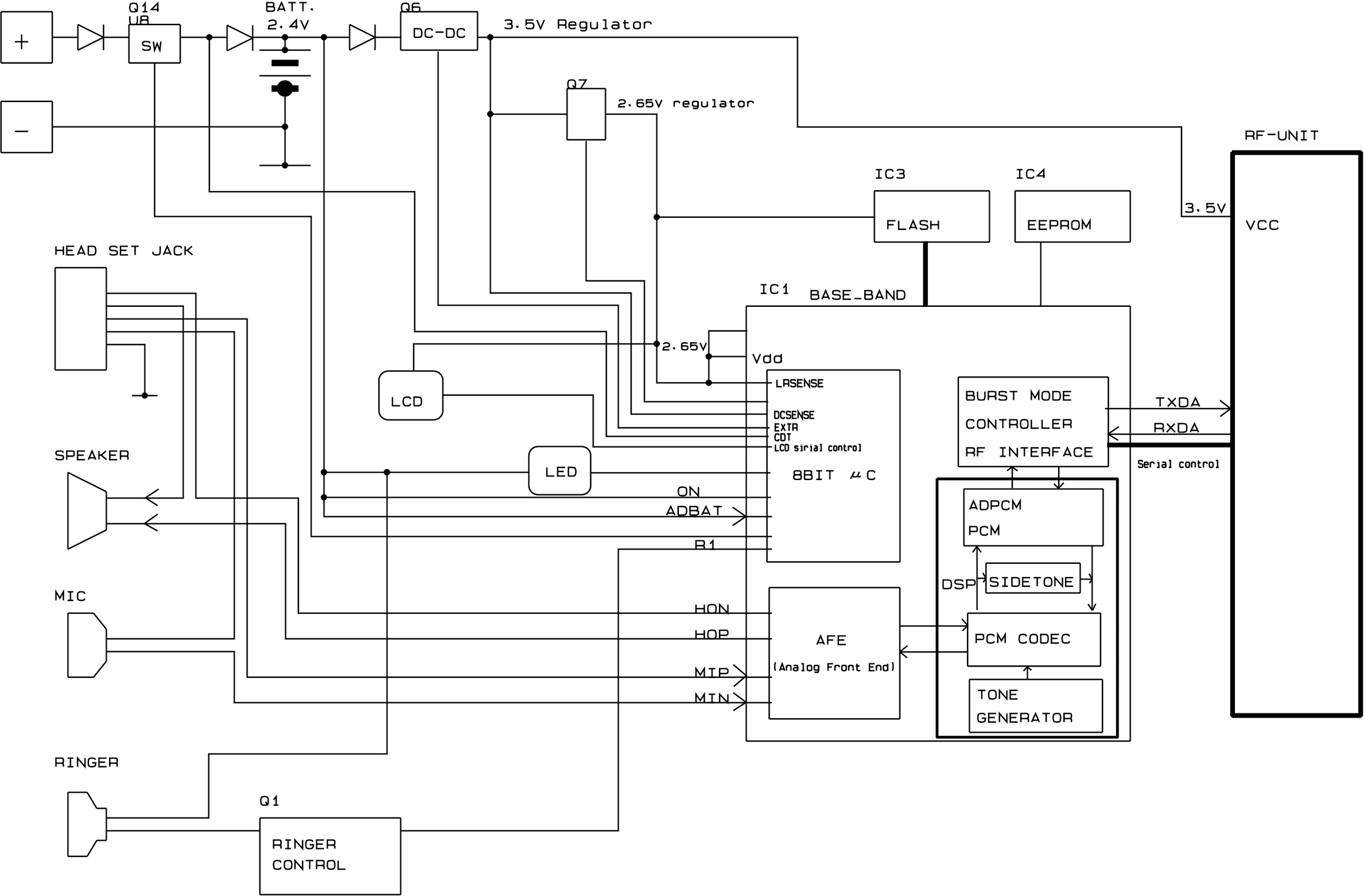
IC1					
Pin No.	LOW	HIGH	Pin No.	LOW	HIGH
1	2.7	2.7	101	0	0
2	0	0	102	0	0
3	0	0	103	0, 2.6	0, 2.6
4	0	0	104	0, 2.6	0, 2.6
5	0	0	105	0	0
6	2.7	2.7	106	0	0
7	0	0	107	0	0
8	0	0	108	2.7	2.7
9	0	0	109	2.1	2.1
10	0, 2.4	0, 2.4	110	2.7	2.7
11	0	0	111	0	0
12	0.3	0.3	112	2.1	2.1
13	1.5	1.5	113	0	0
14	2.3	2.3	114	0, 2.6	0, 2.6
15	0	0	115	2.7	2.7
16	2.7	2.7	116	0	0
17	0	0	117	0.5	0.5
18	2.7	2.7	118	1.1	1.1
19	0	0	119	2.1	2.1
20	0, 2.6	0	120	2.7	2.7
21	0, 2.6	0	121	1.6	1.6
22	0, 2.6	0, 2.6	122	2.6	2.6
23	0, 2.6	0, 2.6	123	1.2	1.2
24	0, 2.6	0, 2.6	124	1.2	0.8
25	0, 2.6	0, 2.6	125	1.2	0
26	0, 2.6	0, 2.6	126	1.2	0
27	0	0	127	1.2	0.8
28	0	0	128	1.2	1.2
29	0	0	129	0	0
30	2.6	2.6	130	1.1	1.1
31	2.6	2.6	131	0	0
32	2.6	2.6	132	2.7	2.7
33	2.7	2.7	133	2.2	0
34	0, 2.7	0, 2.7	134	1.2	0
35	0, 2.7	0, 2.7	135	1.2	0
36	0	0	136	1.2	0
37	2.7	2.7	137	1.2	0
38	0, 2.7	0, 2.7	138	2.7	2.7
39	0.8, 2.6	0.8, 2.6	139	0	0
40	0, 2.6	0, 2.6	140	0, 2.6	0, 2.6
41	0, 2.6	0, 2.6	141	2.3	2.3
42	0, 2.6	0, 2.6	142	0	0
43	0, 2.6	0, 2.6	143	2.7	2.7
44	0, 2.6	0, 2.6	144	0	0
45	0	0			
46	0	0			
47	0	0			
48	0	0			
49	0	0			
50	0	0			
51	0	0			
52	0	0			
53	2.7	2.7			
54	2.7	2.7			
55	0	0			
56	0	0			
57	0	0			
58	0	0			
59	2.6	2.6			
60	2.6	2.6			
61	0, 2.6	0, 2.6			
62	0, 2.6	0, 2.6			
63	0, 2.6	0, 2.6			
64	0	0			
65	0, 2.6	0, 2.6			
66	0	0			
67	2.6	2.6			
68	0	0			
69	0	0			
70	0	0			
71	0	0			
72	2.7	2.7			
73	0	0			
74	0, 2.6	0, 2.6			
75	0, 2.6	0, 2.6			
76	0, 2.6	0, 2.6			
77	0, 2.6	0, 2.6			
78	0, 2.6	0, 2.6			
79	0	0			
80	0	0			
81	0	0			
82	0	0			
83	0	0			
84	0, 2.6	0, 2.6			
85	0, 2.6	0, 2.6			
86	0, 2.6	0, 2.6			
87	0	0			
88	0	0			
89	0	0			
90	2.7	2.7			
91	0, 2.6	0, 2.6			
92	0, 2.6	0, 2.6			
93	0, 2.6	0, 2.6			
94	0, 2.6	0, 2.6			
95	0, 2.6	0, 2.6			
96	0, 2.6	0, 2.6			
97	0	0			
98	0	0			
99	0, 2.6	0, 2.6			
100	0, 2.6	0, 2.6			


J901
C908
C907
CN902
Q913
Q912
J905
C906
C910
C903
C904
C905
R903
C909
R902
R904
C912
C901
C902
R901
D901
C911
R911
R910
R905
LED917
LED916
LED915
LED914
LED913
LED912
LED911
LED910
R909
R908
R907
R906
LED907
LED906
LED903
LED902
J902
J903
LINE1
LINE2
LINE3
LINE4
CONF
HOLD
STOP
LED909
V_MAIL
LED908
LED905
LED904
LED901
ANS1
ANS2
ANS3
ANS4
R914
R915
R916
Q903
Q902
Q901
Q910
Q911
R923
J904
LED918
Q906
Q905
Q904
Q908
Q907
R917
R918
R919
R920
R921
R922
Q909
S1
S2
S3
ALL
S4
S5
S6
REDIAL
LH1
LH5
LH2
LH6
S7
S8
S9
PAUSE
LH3
LH7
S_ASTA
S0
S_SHARP
CALLWAIT
LH4
LH8


CN1
DC+
DC-
2
1
DC_JACK
D1
R1
1.5 1/4W
D2
CHRG_P
CN2
1
1pinL
C1
NC
CN3
CHRG_M
R5
22K
Q1
R2
100
Q6
R12
0
R13
NC
R14
NC
R15
NC
R6
2.2K
R9
2.2K
C2
NC
Q3
Q5
R4
10k
R3
1K
R7
100
R10
100
Q2
Q4
LED1
R8
5.6 1/4W
R11
5.6 1/4W
R16
NC


Q3
B C E
D1
R8
R7
R2
R9
E C B
Q6
B
C
E
Q5
R6
Q1
E C B
E C B
Q4
CN1
Q2
E C B
R1
D2
R5
C1
R4
CHG
CHG
C2
R3
R11
R16
R10
R15
R14
R13
R12
LED1
PQUP10986XA

9V
CN9
DC+ 1
DC- 2
DC JACK
IC501
7.0V CONV
IC504
5.6V REG.
5.0D (VDD5)
5.0A (AVDD5)
Q513·Q514
LIMITTER
Q515·Q516
LIMITTER
6.4V
IC503
3.7V REG
Q503
Q526
SW
Q506
SW
BACK UP BATTERY
CN19
VBAT+ 1
VBAT- 2
Q509
SW
IC502
3.3V CONV
RF UNIT
3.7V (VCC)
TX/RX
VDD5·AVDD5·VDDA12·VDDA34 = 5.0V
VCC = 3.7V
VDD = 3.3V
IC818
VDD5
VDD
BASE_BAND IC
BURST MODE CONTROLLER RF INTERFACE
4× Echo Suppre
4× ADPCM
4× PCM I/F
~~DTMF generator & Receiver~~
~~2 Echo Cancel~~
~~2 CID~~
2× PMB2920 I/F
µC I/F
IOM-2 I/F
IC601
VDD5
AVDD5
MIC/SP CODEC
PCM CODEC
MUX
AFE
SERIAL CONTROL UNIT
IC603
MIC
SP
IC602
HEADSET JACK
CN6
IC602
HANDSET JACK
CN10
3 TX(+)
2 TX(-)
4 RX(+)
1 RX(-)
IC801
PLD
RESET
RESET_PLD
RESET_N
IC805
MAIN CPU
TXD0
RXD0
3.3V VDD
IC803
EEPROM
VDD
BACKUP
CHARGE_CONT
IC806(4M)
FLASH
IC807·IC808
SRAM
IC702
4ch CODEC
VDD5
VDDA12
VDDA34
IOM-2 I/F
DSP
4× CODEC
DU
DD
DD:Data Down stream IC702→DSP→IC818
DU:Data Up stream IC818→DSP→IC702
TAM·SP·C-ID·
LINE ECHO
DTMF GEN/RCV
IC104
DSP (LINE1)
IC204
DSP (LINE2)
NOT USE FOR 2LINE MODEL
IC304
DSP (LINE3)
NOT USE FOR 2LINE MODEL
IC404
DSP (LINE4)
LINE I/F
V+ IC103
PC101
BELL DET
IC101
VCC
IN USE/ EX HOOK
Q103·Q104·Q105
TR_RLY
FROM/TO CPU
LINE4
(NOT USE FOR 2LINE MODEL)
IC203
PC201
BELL DET
IC201
Q203·Q204·Q205
LINE3
IC303
PC301
BELL DET
IC301
Q303·Q304·Q305
LINE2
IC403
PC401
BELL DET
IC401
Q403·Q404·Q405
LINE1
6.4V
3.3V
2AP
LCD
KEY
LED
OPERATIPONAL PCB
IC701
SUB CPU
SDATA
RINGER
IC705(32M)
FLASH
IC704(1M)
SRAM
IC703(2M)
FLASH


+
−
Q14
U8
SW
BATT.
2.4V
Q6
DC-DC
3.5V Regulator
Q7
2.65V regulator
RF-UNIT
IC3
FLASH
IC4
EEPROM
3.5V
VCC
HEAD SET JACK
IC1
BASE_BAND
2.65V
Vdd
LCD
LRSENSE
DCSENSE
EXTR
CDT
LCD sirial control
8BIT μC
BURST MODE
CONTROLLER
RF INTERFACE
TXDA
RXDA
Serial control
SPEAKER
LED
ON
ADBAT
R1
ADPCM
PCM
DSP
SIDETONE
MIC
HON
HOP
MIP
MIN
AFE
(Analog Front End)
PCM CODEC
TONE
GENERATOR
RINGER
Q1
RINGER
CONTROL

RX Signal (Line1~4)

TX Signal (Line1~4) for Portable Talk Mode

TAM Sending/Receving Signal (Line1~4)

(1) (2) (3~13)(14) (15) (16~19) (20~23)(24)(25) (26~29)(30)(31~34)(35~38)(39~42) (43, 44) (45) (46) (47~49)(51~53) (54) (55, 56) (57) (58, 59) (60) (61, 62) (63~67)